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Haley & Aldrich, Inc.

PHASE I GEOTECHNICAL DATA REPORT
FAN PIER DEVELOPMENT
SOUTH BOSTON, MASSACHUSETTS

Consulting

Geotechnical Engineers,

Geologists and

Hydrogeologists

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PHASE I GEOTECHNICAL DATA REPORT
FAN PIER DEVELOPMENT
SOUTH BOSTON, MASSACHUSETTS

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for
HBC Associates
470 Atlantic Avenue
Boston, Massachusetts

File No. 5556

April 1986

Haley & Aldrich, Inc.

Consulting
Geotechnical Engineers,
Geologists and
Hydrogeologists

238 Main Street
P.O. Box 60
Cambridge, MA 02142
617 492 6460

30 April 1986
File No. 5556

HBC Associates
470 Atlantic Avenue
Boston, Massachusetts 02110

Attention: Mr. Lewis H. Spence

Subject: Phase I Geotechnical Data Report
Fan Pier Development
South Boston, Massachusetts

Gentlemen:

We are pleased to submit herewith our Phase I Geotechnical Data Report summarizing preliminary subsurface exploration and laboratory testing programs completed to date for the subject project. This report, together with the accompanying set of large scale drawings, was assembled for convenient reference and provides geotechnical data without interpretation or recommendations. Preliminary recommendations and criteria for design have been provided on an on-going basis during master plan studies and will continue as the design evolves.

This work was undertaken in accordance with our proposal of 20 September 1984, and your subsequent authorization.

Sections II and III of this report present a detailed description of the site and subsurface conditions while Section IV provides a summary of the investigations completed.

Thank you for engaging us to perform this work. We look forward to working with you and other members of the design team during subsequent design and construction phases.

Branch Offices
Glastonbury, Connecticut
Portland, Maine

Affiliate
H & A of New York
Rochester, New York

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I. INTRODUCTION

1-01. General

This report presents a summary of the preliminary subsurface exploration and laboratory testing programs completed for the proposed Fan Pier Development project on Northern Avenue in South Boston. The 18.5-acre site extends easterly along Northern Avenue from the entrance of the Fort Point Channel to approximately Pier 4. The location of the project is indicated on the Project Locus, Figure 1. The proposed development studied was as detailed in the Master Plan Study undertaken by Cesar Pelli & Assoc. of New Haven, CT. The 3.4-million square ft. (sq. ft.) mixed-use development consists of a hotel, low and high rise residential, retail and office space, a marina, boat moorings, public parks and structured underground parking.

The geotechnical data presented herein include:

1. Subsurface data collected and summarized by Haley & Aldrich, Inc. during previous involvement with various projects for Mr. Anthony Athanas (Anthony's Pier Four, Inc.)

2. Subsequent subsurface explorations completed during the period September 1984 through December 1985 and associated laboratory testing. This work was completed by Haley & Aldrich, Inc. for the purpose of providing specific supplemental data for the proposed Master Plan Development.

Some of the data compiled herein has been presented as part of our previous report entitled, "Preliminary Geotechnical Evaluations for the Proposed Development of Piers 1, 2 and 3, South Boston, Massachusetts", dated 12 October 1984.

Bound separately are a set of twelve drawings identical to Figures 2 through 13, reproduced at large scale for study purposes.

1-02. Purpose and Scope

The purpose and scope of this report is to provide a convenient reference document which includes a compilation of the geotechnical data pertinent to the project. These data have been compiled in appendices which are referenced throughout the report.

More specifically, our scope of work included:

- Review and compile the available information previously obtained with regard to the existing subsurface soil, rock and groundwater conditions at the site.
- Preparation of a Phase I test boring program to supplement previously available information; a program of 24 test borings completed on land and 8 borings completed over water was undertaken to further define the subsurface soil, rock and groundwater conditions.
- Field monitoring of the test borings and installation of groundwater observation wells.
- Performance of laboratory tests on selected samples of soil to aid in its classification and evaluation of its engineering properties.
- Preparation of a subsurface exploration location plan, seven subsurface profiles, and elevation contour plans showing the top of natural inorganic soil, glacial till and bedrock.

1-03. Elevation Datum

The elevations presented herein are referenced to Boston City Base (BCB), wherein El. 0.00 (BCB) is 5.65 ft. below National Geodetic Vertical Datum (NGVD) formerly USC&GS Mean Sea Level Datum of 1929.

Tide tables and bottom soundings on many site or navigation plans are referenced to Mean Low Water (MLW) Datum wherein MLW datum is 1.07 ft. above BCB (El. 0.00 MLW = 1.07 BCB).

1-04. Limitations

This report has been prepared for specific application to the subject project in accordance with generally accepted geotechnical engineering practice. No other warranty expressed or implied is made.

The analyses and recommendations submitted in this report are based, in part, upon the data obtained from the referenced subsurface explorations. The nature and extent of variations between the explorations may not become evident until con-

struction. If variations then appear evident, it will be necessary to re-evaluate the recommendations contained in this report.

This preliminary geotechnical data report is not considered sufficient for final design. Additional subsurface explorations and laboratory testing are recommended to be conducted during subsequent design phases.

II. FIELD AND LABORATORY INVESTIGATIONS

2-01. Previous Subsurface Explorations

During previous Haley & Aldrich, Inc. (H&A) studies of the site area, various sources were researched to compile the readily available subsurface information. These sources included Massachusetts Department of Public Works, Port of Boston Authority, and test boring results published by the Boston Society of Civil Engineers. In addition, test borings were conducted in 1970 for H&A in connection with a proposed development of Piers 1 through 4. Locations of these previous borings, in addition to individual test borings, are included in Appendix A.

As part of our initial involvement with the Fan Pier development project, a series of 15 machine-excavated test pits were completed at the site. These test pits were excavated to visually examine the near-surface miscellaneous fill soils and to obtain soil samples for chemical and physical testing deemed necessary for environmental studies. Information derived from the test pits is included for reference herein as Appendix B.

2-02. Phase I Subsurface Explorations

A. Test Borings

The Phase I subsurface exploration program consisted of the completion of 32 test borings, designated the B100 and B300 series borings. These borings were conducted during the period 17 September through 12 December 1985 by Guild Drilling Company, Inc. of East Providence, Rhode Island, under contract to HBC Associates. Of these 32 test borings, 24 were completed on land and 8 over water, at the locations indicated on Figure 2.

Test borings completed on land were advanced to depths ranging from 61.0 to 159.1 ft. and water borings were completed to depths ranging from 32.0 to 75.5 ft. Logs of each test boring as prepared by Haley & Aldrich, Inc. are included in Appendix C. In addition, a summary of the subsurface strata encountered, elevations for the top of each strata and corresponding strata thickness at each test boring have been summarized in Table I.

Standard test boring techniques were used typically to advance the cased boreholes that ranged in size from 3-inch to 4-inch inside diameter, (ID). Additionally, at some locations a 3-1/2 in. ID hollow stem auger was used to advance a borehole through the fill soils. Casing sizes and installed lengths of casing and augers are noted on individual test boring logs. A standard 1-3/8 in. ID by 2-in. outside diameter, (OD) split-spoon sampler (ASTM D1598-67-1974) was used to obtain soil samples from test borings typically at 5-ft. intervals. The number of blows required to drive the sampler each six inches for a total of 24 inches into "undisturbed" soil using a 140-lb. hammer, falling freely through a distance of 30 inches, was recorded. The standard penetration resistance is defined as the number of blows required to drive the standard split-spoon sampler with a 140-lb. hammer a distance of 12 inches, counted from the 6th to 18th inch that the sampler is driven.

In addition, 2-in. and 3-in. OD thin walled tube samples of clay were recovered from selected test borings for laboratory strength and consolidation testing. Thin-walled tube soil samples were obtained generally in accordance with ASTM D1587.

Observations of water levels in boreholes noted on the logs were made during and after completion of drilling. These observations may have been influenced by drilling operations and may have been taken before water levels in borings had time to stabilize. Consequently, these borehole water levels may not reflect the actual groundwater level. In addition, it is important to note that water levels at the site can be expected to vary greatly with tidal fluctuations. Other factors which may influence groundwater levels include fluctuations due to seasonal changes and precipitation.

An H&A geologist was present at the site during field explorations to:

- Observe and document the subsurface conditions encountered;
- Vary the depth of subsurface explorations as well as sampling location, to meet the subsurface conditions encountered; and

- Document the installation of groundwater observation wells.

B. Groundwater Observation Wells

A total of five groundwater observation wells were installed in completed boreholes at test borings B101, B104, B112, B116 and B118. Each observation well consists of a 10-ft. length of 2-inch ID machine slotted PVC well screen cemented to a solid PVC riser pipe. Details of individual installations are presented in the groundwater observation well installation reports included in Appendix D. In addition, data obtained from periodic monitoring of these observation wells and corresponding tide levels during the period 4 October to 12 March 1986 are included in Appendix D.

2-03. Laboratory Test Program

Laboratory tests were performed on soil samples obtained from five 3-in. OD and three 2-in. OD undisturbed thin-walled tube samples taken in test boring B118 at depths ranging from 50.0 to 97.0 ft. The material tested was primarily from the Boston Blue Clay stratum.

The laboratory program included numerous water content determinations and measurements of index strengths (using the Torvane, the Pocket Penetrometer and the Shear Vane). Eight Atterberg Limits determinations were made; on soil from each of the eight undisturbed tube samples. In addition, two hydrometer tests were performed to help classify the clay soil.

A total of five oedometer tests were performed on soil samples from the 3-in. OD undisturbed tube samples, to aid in the evaluation of the stress history of the site as well as the compressibility characteristics of the material. The undrained shear strength profile of the material was estimated with the results from a total of five unconsolidated, undrained (UU) tests performed on soil samples from the 3-in. OD undisturbed samples.

The laboratory test data are summarized in Appendix E. Significant engineering properties of the clay stratum are summarized graphically on Figure 13. In general, the laboratory tests were performed in accordance with the rele-

vant ASTM specifications. Where appropriate and/or necessary, procedures suggested in various publications such as Soil Testing for Engineers by T. W. Lambe (1957) and the Manual of Soil Laboratory Testing, Volumes 1 and 2 by K. Head (1982) were incorporated in the program.

III. SITE CONDITIONS

3-01. General

The existing site, currently utilized primarily for commuter parking, is bounded almost entirely on three sides by water, with Northern Avenue forming the southern boundary. The parcel consists of 18.5 acres of which 2.6 acres is open water and 15.9 acres is land inbound of granite seawalls or pile supported wharves.

This section of the report will present a discussion of the site history, and site and subsurface conditions. These factors must be considered and incorporated into development planning and during future design studies.

3-02. Site History

Information on the history and previous usage of the site was obtained from historical records of the Bostonian Society, the State House Archives, Haley & Aldrich, Inc. files, and other sources. The records included maps, atlases, photographs, directories and other published or available information pertaining to the site.

In 1852 this part of Boston Harbor was a tidal flat, and Piers 1 and 2 did not exist. In 1874, filling of the South Boston Flats was underway and had progressed as far as Summer Street. During 1875, granite seawalls had been constructed to form Piers 1 and 2 and dredging of the harbor bottom in Fort Point Channel and Boston Harbor was progressing, with fill being placed to El. 5 in some areas, and El. 10 in other areas of Piers 1 and 2. The area was owned by the Commonwealth of Massachusetts and was known as the South Boston or Commonwealth Flats. It appears that a Pier 3 was originally planned between Piers 2 and 4, however, no record of this pier having been constructed was found. By 1882, filling of the Flats was complete and railroad spur lines had been laid out to Pier 1.

The 100 acre railroad site located within the Commonwealth Flats area and including Piers 1 and 2, was initially used as a terminal by the New York and New England Railroad. In the 1890's, all of Pier 2 and the easternmost portion of Pier 1 was occupied by wood frame warehouse-type structures through which railroad spur tracks ran. The remainder of Pier 1 was

covered with a dozen spur tracks (Fan yard) for switching of trains. The South Boston Terminal had the advantage of fronting on deep water in the harbor and could service the transatlantic freight steamships which were calling at the Port of Boston at that time.

Site history and usage from 1930 through 1981 indicates that a variety of tenants occupied the site throughout this fifty year period. Between 1934 and 1967, the two large original warehouses were razed and were replaced by two smaller warehouses, one of which exists on site today. Pier 1 was used through the years by a variety of businesses including railroads, shipping agents, warehouse, freight and trucking companies. In recent years, since 1960, the site has been used for parking, with the area adjacent to Fort Point Channel being used for boat docking. A lobster dealer utilized the end of Pier 2 for a storage yard and docking area.

During the 1960's, Mr. Anthony Athanas acquired the property, and in 1969 filling of the area between Piers 1 and 2 was undertaken. In 1971, additional fill was placed to create the land area of the site between Piers 2 and 4.

3-03. SITE CONDITIONS

The existing site is relatively flat with grades typically in the range of El. 17 to 18. The majority of the site is utilized for commuter parking except for the following areas:

- An existing one-story warehouse structure located on Pier 1 and utilized by Anthony's Pier 4 as a warehouse and for cold storage.
- A small sandwich shop located along Northern Avenue.
- A pile supported timber wharf at the west side of the property utilized for docking of harbor cruise and ferry boats.
- An area where several old railroad cars are abandoned along one of the original railroad spurs on Pier 1.
- An area between Piers 1 and 2 where a large stockpile (15 to 20 ft. high) of granite blocks have been placed.

The seawalls along the water's edge at Pier 1 and at the north end of Pier 2 consist of large cut granite blocks forming a near vertical face granite block seawall. A small section of the seawall at the end of Pier 2, approximately 10 ft. long, near the intersection of Pier 2 and the Pier 1-2 slip, was observed to be in need of minor repair.

The seawall perpendicular to Northern Avenue, along the east side of Pier 2, moved significantly outward and downward prior to and during the late 1960's. This wall was stabilized in the early 1970's, by excavation and removal of the existing soils behind the wall and replacement of the backfill with light weight fill. This wall is considered to be marginally stable in its present condition. The seawalls constructed perpendicular to Northern Avenue appear to consist of a more randomly placed granite stone as compared to the outboard seawalls. A detailed condition survey above and below water level is recommended to provide data to evaluate the current stability and existing conditions relative to remedial repairs.

Vertical seawalls do not currently exist at two locations along the water's edge. One location is near the end of Pier 2 between Piers 1 and 2, where a brick and concrete rubble dike was constructed during the 1969 Pier 1-2 slip filling. The slope of the dike is faced with randomly placed large granite blocks. The second location is along the water's edge between Piers 2 and 4 in the area filled in 1971. The shore protection in this area consists of a sloped, granite block facing. The granite facing was placed along the slope of a brick and building rubble dike, previously constructed to contain the fill placed inboard of the dike. A timber pile-supported marginal wharf exists at the western edge of the site near the Fort Point Channel. The existing condition of this structure will need to be determined during future design phases if it is to remain.

The existing on-site surface water catch basins are believed to drain directly into the harbor at various locations along the seawall. The existing surface treatment varies from asphalt pavement and cobblestone, to ash and cinders. Some vegetation exists along the east side of Pier 2, consisting primarily of grass and weeds.

3-04. Subsurface Conditions

The available data from subsurface explorations indicate the following soil and rock sequence in order of increasing depth below ground surface.

- Miscellaneous Fill
- Organic Soils
- Nearshore Marine Deposits
- Boston Blue Clay
- Outwash Deposits
- Glacial Till
- Bedrock

The above sequence reflects the general order of deposition of the soils above the bedrock. One or more of the units may be absent at specific locations within the site area. The soil strata encountered are discussed in the order of deposition, including the bedrock, and are as follows:

A. Bedrock. The bedrock underlying the site is known locally as Cambridge Argillite. The bedrock is typically found to be highly fractured and weathered near the surface, becoming moderately hard and fractured with depth. The data indicate that a zone of highly fractured weathered rock may extend to a depth of 20 ft. or more. The depth to bedrock ranges from 117.0 to 157.5 ft. below existing ground surface. Refer to Figure 10 for "Top of Bedrock Elevation Contour Plan".

B. Glacial Till. The advance of the glacial ice sheets over the New England area during the Pleistocene Epoch resulted in the deposition of an unsorted mixture of clayey sand and gravel to sandy clay, referred to as glacial till. This material, deposited over the bedrock surface, is known to contain numerous cobbles and boulders. The glacial till soils are typically classified as dense to very dense. The top of the glacial till stratum varies from El. -75.8 to El. -124.1 (94.5 to 140.5 ft. below ground surface) across the site. Refer to Figure 11 for "Top of Glacial Till Elevation Contour Plan".

C. Outwash Deposits. As the glacial ice melted and the edge of the glacier retreated, soil frozen within the ice mass was carried by meltwater streams and deposited as a stratum of sand and gravel over the glacial till soils. The outwash deposits were found to consist of dense to very dense, coarse to fine sand with various amounts of gravel and were found to vary in thickness from 0 to 18.0 ft.

D. Boston Blue Clay. A thick deposit of silty clay, known locally as "Boston Blue Clay", overlies the glacial till and outwash sand. This stratum was deposited following the retreat of the glacial ice sheets and a rise in the sea level that inundated the site. The fine-grained materials comprising the majority of this layer settled out of suspension in the calm waters of the Boston Basin. The deposit, varying from 42.0 to 109.5 ft. in thickness, consists of soft to stiff gray silty clay. Near the surface of the deposit, the clay becomes very stiff as a result of desication during times of lower sea level.

E. Nearshore Marine Deposits. A thin layer of silty fine sand typically overlies the Boston Blue Clay except in areas where dredging occurred. This granular soil strata, ranging from 2.2 to 12.0 ft. in thickness where encountered, was deposited in a nearshore marine environment during a period when sea levels fluctuated slightly. The elevation of the surface of The Nearshore Marine Deposits where encountered, varies from El. 2.4 to El. -20.0.

The surface of the nearshore marine deposits and clay stratum varies considerably due to alterations at the site from past usage. Previously existing channels and boat slips are evident based on site history, the test boring data and bottom soundings conducted prior to recent site filling in 1969 and early 1971. Figure 12 shows the elevation contours of the top of natural inorganic soils.

F. Organic Soils. Following deposition of the Marine Deposits during the glacial age, two different types of organic deposits formed throughout the harbor area:

- Organic silt with shells, which were deposited in salt water by tidal action; and
- Salt marsh peat, which accumulated along the shore line of a slowly rising sea.

The organic silt and peat are typically soft to medium stiff, with low strength and high compressibility. The organic soil deposits range from 1.0 to 30.0 ft. in thickness.

G. Miscellaneous Fill. With development of the harbor area during and following the 17th century, many waterfront structures were built out into the harbor. The site area was filled during the 1860's and 70's for development of harbor facilities during filling of the South Boston tidal flats.

The fill can be expected to consist of an unsorted mixture of sand, gravel, silt, clay, wood, brick, cinders, glass, granite blocks, etc. Numerous wood piles and other foundation elements that supported old wharves and other previous structures will be present within the fill soils. Based on historic records for the site, it is believed that the initially placed fill (El. 0 to El. 12) at Piers 1 and 2, consists of dredge spoil excavated from near the mouth of the Fort Point Channel. The upper five feet (El. 12 to El. 17) of the fill consists of more granular soils most probably placed as a cap over the softer dredged soils. Consequently, the original fill soils will consist of a variety of soil types intermixed as a result of the dredging and placement process.

The recent fill materials, placed during the late 1960's and early 1970's between Piers 1 and 2 and between Piers 2 and 4, consist primarily of inorganic mineral soils excavated from building construction sites throughout the Boston area. Boulders greater than 12 inches in diameter, organic soils, wood, trash, and other deleterious materials were precluded from the fill by the specification for the work. Although the wood decking, stringers and pile caps of the existing wharves were removed prior to placing the fill, the piles and old pile supported seawalls between Piers 1 and 2 were buried. The locations of these buried structures were surveyed prior to placement of the fill and are recorded on survey drawings for reference. Approximate locations of these seawalls are also indicated on Figure 2.

In summary, the miscellaneous fill soils can typically be characterized as fine-grained soils consisting of sandy clays or silty clays with zones or layers of organic or granular soils. Fill thickness varies widely across the site, ranging in thickness from 12.5 to 56.0 ft. Note that fill was not encountered in the eight borings completed over open water.

Generalized soil profiles are presented on Figures 3 through 9 and summarize subsurface conditions as interpreted from available test boring information. Figures 3 and 4 present generally east-west trending profiles across each of the piers and slips while Figures 6 through 9 present profiles trending north-south along the pier and slip axis. Profile C-C, included as Figure 5, displays the subsurface conditions along the axis of the proposed canal.

3-05. Groundwater Conditions

Water levels throughout the site respond to tidal fluctuations as may be seen in the groundwater observation well data included in Appendix D. These data indicate that the response to tidal action varies considerably across the site. This is presumably the result of the complex nature and variable permeability of the near-surface fill soils.

In addition to tidal effects, groundwater levels may also be influenced by other factors, such as seasonal variations, rainfall, temperature and possible inflow and outflow from nearby storm drains or sewage lines, especially those discharging into the harbor.

Water levels as measured in the five observation wells installed at the site ranged from El. 0.8 to El. 13.1. Generally, water levels should be expected to reflect tide levels in Boston Harbor, which typically range from El. 1.1 at Mean Low Water (MLW) to El. 10.5 at Mean High Water (MHW).

For design purposes, consideration must be given to storm tides and the probability that below-grade structures (particularly those near the site perimeter) will experience groundwater levels equal to the storm tide level. Refer to the following Section for Boston Harbor Tide Elevation data.

3-06. Tide Levels

The US Army Corps of Engineers has developed data on observed tide levels in Boston Harbor and the predicted tide level frequency of occurrence. The following tide level frequency data are estimated by the Corps for data through August 1979.

FREQUENCY IN YEARS	HIGH TIDE ELEVATION(1) (Boston City Base)
1	13.55
5	14.35
10	14.75
20	15.15
25	15.55
50	15.65
100	15.95
200	16.35

(1) These data are for wave free water levels. Wind driven water and waves will increase water levels during storm conditions.

3-07. Summary of Laboratory Test Results

A. General

The focus of the initial phase laboratory test program, which includes classification, index strength, consolidation and strength tests, has been on undisturbed samples obtained from the Boston Blue Clay stratum in test boring B118. Consolidation (oedometer) tests were performed to estimate the stress history of the stratum and to evaluate the compressibility characteristics for use in settlement analyses. The undrained shear strength of the clay was evaluated, to aid in the estimation of bearing capacity, skin friction and slope stability, as required for various foundation design evaluations.

B. Classification Testing

As an aid in classification of the fine-grained material, typically the Boston Blue Clay stratum underlying the site, Atterberg Limits were determined and hydrometer tests were performed in the laboratory. To assess the general characteristics of the in-situ material, frequent measurement of water content and index strength tests were performed utilizing the Torvane, the Lab Vane, and the Pocket Penetrometer. These tests were performed on soil from the five undisturbed 3-in. OD and three undisturbed 2-in. OD thin-walled tube samples obtained in test boring B118, at depths ranging from 50 to 97 ft.

These data are summarized in Table E-1, included as part of Appendix E. This table lists the results as a function of sample number and depth. In addition, some of these data are plotted with respect to elevation in Figure 13.

The classification test results indicate that the Boston Blue Clay stratum is comprised of stiff to medium stiff, gray silty clay with frequent silty fine sand layers and seams. In general, the liquid limit (w_l) and plastic limit (w_p) of the material ranges from 42 to 54 percent and 23 to 29 percent, respectively. Natural water contents are essentially at or just below the liquid limit, indicating liquidity indices equal to or less than one.

C. Stress History and Compressibility Characteristics

Estimates of the stress history (i.e, the variation in preconsolidation pressure with depth as compared to the existing vertical overburden stress) as well as the compressibility parameters of the Boston Blue Clay stratum are necessary to enable estimation of the consolidation settlements due to net changes in stress resulting from excavation, imposed structure loads and/or groundwater level changes. Establishing the stress history is also important for estimating the variation in strength with depth.

Five oedometer tests were performed in order to measure the strain-log stress behavior and to estimate the preconsolidation pressures at various depths within the marine clay deposit. These consolidation tests were performed on soil obtained from the five undisturbed 3-in. OD thin-walled tube samples taken in test boring B118. The strain-log stress curves from these tests, which are based on strains at the end of primary consolidation, are contained in Appendix E as Figures E-2 through E-6.

Preconsolidation pressures, σ'_p , were estimated from the strain-log stress curves using Casagrande's construction. These data, listed in the summary table (Table E-1), are plotted versus elevation in Figure 13, and are used to estimate the shape of the preconsolidation pressure curve. These data show that, when compared to the effective overburden stress, the clay stratum is more overconsolidated at the top of the layer $\left\{ \text{OCR} \cong \frac{\sigma'_P}{\sigma'_{vo}} \cong 3.4 \right\}$ than near the bottom of the stratum (OCR $\cong$ 1).

This phenomenon is typical in the marine clay throughout the Boston area and is attributed to desiccation of the upper portion of the clay due to sea level lowering during the latter part of the Pleistocene Epoch (approximately 12,500 to 10,000 years ago).

Two parameters pertinent to the estimation of settlements, as a result of compression of the clay stratum, are the recompression ration (RR) and the compression ratio (CR). These parameters are evaluated from strain-log stress curves obtained from oedometer tests. Both values determined from each oedometer test, expressed as the change in strain divided by the change in log stress over the appropriate ranges of stress, are tabulated in Table E-1, and plotted versus elevation in Figure 13. RR, used to estimate settlements when the final stress is less than the estimated preconsolidation pressure, ranges between 0.014 and 0.023, with an average RR of approximately 0.019. CR, on the other hand, ranges from 0.158 to 0.244, approximately ten times the magnitude of RR. The average CR, used to estimate settlements for the stress increase on the soil beyond the preconsolidation pressure is equal to about 0.21.

D. Strength Parameters

The Torvane results plotted in Figure 13, indicate a trend of decreasing index undrained shear strength with depth. The exact magnitude of the Torvane results are not considered reliable for use in engineering designs requiring estimates of undrained shear strength. These index test results, however, are useful because the quantity of data obtained can help to define general trends. In addition, within the individual undisturbed samples, variation in the index strengths can help identify disturbed zones in the soil sample, and hence can be used to help obtain the least disturbed specimens for more sophisticated testing. The strength tests performed in this preliminary laboratory test program were unconsolidated undrained (UU) compression tests. These tests, which are relatively inexpensive and quickly performed, provide a preliminary measure of the in-situ strength profile. UU tests were performed on five specimens from undisturbed 3-in. OD thin-walled tube samples. The peak strength and corresponding axial strain results of these tests are listed in the summary data table in Appendix E.

In general, the UU test results must be interpreted with care because of the potential for sample disturbance causing a reduction in strength. Undrained shear strength, as measured by the UU tests, varies from 892 to 2128 psf with no apparent consistent variation with depth, as indicated by the solid circles plotted in Figure 13. However, when the initial effective stress is considered in relation to the preconsolidation pressure, the tests can be reinterpreted to show a distinct trend in decreasing undrained shear strength with depth, as indicated by the solid squares and the shaded area in Figure 13. The essentially linear decrease ranges from approximately 2000 psf at El. -30 to 1400 psf at El. -76. Axial strains at failure range between 2.8 and 4.2 percent.

E. Future Laboratory Testing

The results of the laboratory test program discussed above establish a data base which can be used for the following:

- To make preliminary evaluations of various compressibility and strength parameters; and
- For reference and direction when conducting a more extensive and comprehensive laboratory test program for furthering evaluation of design soil parameters.

From the data contained in Appendix E, preliminary estimates of soil parameters have been obtained, as discussed in the beginning of this section.

A more extensive laboratory program is to be conducted on undisturbed samples taken from additional test borings: B104, B105, B303, B305 and B313. This extended laboratory program currently underway will include classification and index tests on the soil samples obtained. In addition, approximately 15 oedometer tests will be performed to:

- Better establish the estimated preconsolidation pressure curve presented in Figure 13, and to provide a larger data base from which the compressibility parameters can be derived, recognizing the vulnerability of the test results to sample disturbance and to minor local variations in silt and/or sand content; and

- Help evaluate the lateral variation in the preconsolidation pressure curve, by performing tests on samples obtained from different locations at the site.

The strength tests to be conducted in the design phase of the laboratory test program include additional UU tests and isotropically consolidated, undrained, triaxial compression CIU(C) tests. The numerous UU tests, on samples from various depths and locations, will help identify zones of local variation in behavior. Data from the CIU(C) tests on selected samples, on the other hand, can be used in conjunction with relevant data available in the literature, to establish a reliable soil strength profile.

An additional focus of the extended laboratory test program is the classification of some of the more coarse-grained strata encountered at the site. These strata include the Nearshore Marine Deposits and the Glacial Till stratum which underlies the Boston Blue Clay. Classification of these materials will involve grain size analyses and, where necessary, Atterberg Limit determinations.

IV. SUMMARY OF INVESTIGATIONS

4-01. General

This report presents a summary of the preliminary subsurface explorations and laboratory testing programs completed for the proposed Fan Pier Development project. This section presents a summary of the field and laboratory investigations completed for the project in addition to a summary description of the site surface and subsurface conditions.

4-02. Field and Laboratory Investigations

1. A recent subsurface exploration program, consisting of 32 test borings, was completed at the locations shown on Figure 2. Logs of these explorations are included in Appendix C, with pertinent results summarized in Table I.

2. The results of previous test borings completed at the site are also included herein. Logs of these explorations, in addition to a location plan, have been included in Appendix A. Pertinent data from these explorations have also been included as part of Table I.

3. A series of 15 machine-excavated test pits were completed as part of our assessment of the site for the presence of oil and hazardous materials. Logs of these test pits are included herein as Appendix B.

4. A total of five groundwater observation wells were installed in selected test borings upon completion. Logs of each well installation, in addition to water levels observed to date, are included in Appendix D.

5. A laboratory testing program was performed to assist in soil classification and for initial determination of engineering properties. Test results are included in Appendix E. Additional laboratory testing work is underway to provide a more in-depth determination of the engineering soil properties. Results of these tests will be summarized in a report to be submitted at a later date.

4-03. Site and Subsurface Conditions

1. Ground surface at the site is relatively flat with grades typically in the range of El. 17 to El. 18. The site is

bounded primarily by granite block seawalls on the north, east and west. Surface conditions consist primarily of parking areas, two small 1 to 1-1/2 story buildings exist on site, and a granite block stockpile. Refer to site plan which is included as Figure 2.

2. Historical data indicate that the entire site is filled land with seawalls surrounding the filled portions. Two old ship slips exist on site within the current filled areas. Within these slips fill depths approach 56.0 ft.

3. Test boring explorations indicate a complex soil sequence at the site as follows, progressing from ground surface downward:

   - A surface layer of miscellaneous FILL, varying widely in thickness from 12.5 to 56.0 ft.
   - A deposit of ORGANIC SOILS consisting of organic silt and/or salt marsh peat, ranging from 1.0 to 30.0 ft. in thickness where encountered.
   - NEAR SHORE MARINE DEPOSITS, typically consisting of silty fine sand and ranging in thickness from 2.2 to 12.0 ft. These soils were typically not encountered in areas of the site which have been dredged in the past.
   - BOSTON BLUE CLAY stratum which typically consists of a soft to very stiff gray silty clay, ranging in thickness from 42.0 to 109.5 ft.
   - A strata of glacial OUTWASH DEPOSITS consisting of sand and gravel, ranging in thickness from 0 to 18.0 ft.
   - A hard GLACIAL TILL stratum comprised of clayey sand and gravel to sandy clay with occasional cobbles and boulders, varying in thickness from 3.0 to 34.0 ft.
   - BEDROCK underlying the glacial till consisting of Cambridge Argillite. The top of bedrock varies from El. -101.2 to El. -141.1 at the boring locations.

4. Groundwater levels in the five monitoring wells installed on site were observed to range from El. 0.8 to El. 13.1

and are expected to respond generally to tidal fluctuations. Groundwater level data are included in Appendix D.

5. Data on tide levels in Boston Harbor have been developed by the US Army Corps of Engineers. These data indicate a typical Mean Low Water at approximately El. 1.1 and a typical Mean High Water at approximately El. 10.5. In addition, a predicted tide level frequency of occurrence table has been developed for the 1-year to 200-year storm tide levels. This table is included in Section 3-06 of this report.

6. Generalized subsurface profiles are shown on Figure 3 to Figure 9. Elevation contours of the assumed top of bedrock, glacial till and natural inorganic soils are included as Figures 10 through 12, respectively.

V. FUTURE GEOTECHNICAL SITE AND SUBSURFACE INVESTIGATIONS

Based on the information included in this report, it is recommended that the following additional site and subsurface investigations be completed prior to final project design:

1. A detailed condition survey along the entire length of the existing seawalls and of the marginal wharf located adjacent to the Fort Point Channel to provide data for the evaluation of the condition of these structures, assessment of remedial repairs and the stability of the seawalls with respect to current and future conditions.

2. A more extensive laboratory soil testing program to better define the strength and compressibility characteristics of the marine clay soils and to evaluate potential lateral variations in soil properties across the site.

3. A supplementary field exploration program to include the completion of additional test borings and test pits. Test boring data is necessary to more accurately define soil conditions at each proposed building location. Test pits are required to define the location and extent of near surface obstructions to pile driving and other construction which may include old building foundation elements, timber piles, granite blocks and buried seawalls.

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Tables

HBC ASSOCIATES
FAN PIER DEVELOPMENT
SOUTH BOSTON, MA

FILE NO. 5556
HALEY & ALDRICH, INC.

TABLE 1
SUMMARY OF SUBSURFACE DATA

TEST BORING	GROUND SURFACE EL.	THICKNESS OF STRATUM (FT)						ELEVATION TOP OF STRATUM						ELEV. BOTTOM OF BORING
		FILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ROCK	
B101	17.2	19.5	10.0	NE	83.0	NE	21.5	-2.3	NE	-12.3	NE	-95.3	-116.8	-128.8
B102	16.2	24.0	NE	NE	98.0	6.0	10.0	NE	NE	-7.8	-105.8	-111.8	-121.8	-147.8
B103	16.0	18.0	4.0	6.0	101.5	NE	17.5	-2.0	-6.0	-12.0	NE	-113.5	-131.0	-148.1
B104	16.4	53.0	NE	NE	87.5	NE	17.0	NE	NE	-36.6	NE	-124.1	-141.1	-162.7
B105	16.8	24.0	6.0	9.5	73.0	NE	31.5	-7.2	-13.2	-22.7	NE	-95.7	-127.2	-151.2
B106	14.6	29.0	7.0	NE	ND	ND	ND	-14.4	NE	-21.4	ND	ND	ND	-71.4
B107	16.7	21.0	12.5	NE	ND	ND	ND	-4.3	NE	-16.8	ND	ND	ND	-74.3
B108	16.5	36.5	NE	5.0	ND	ND	ND	NE	-20.0	-25.0	ND	ND	ND	-70.0
B109	17.1	42.0	12.0	NE	ND	ND	ND	-24.9	NE	-36.9	ND	ND	ND	-88.9
B110	15.8	21.0	NE	8.0	ND	ND	ND	NE	-5.2	-13.2	ND	ND	ND	-70.2
B111	17.3	33.0	24.0	NE	ND	ND	ND	-15.7	NE	-39.7	ND	ND	ND	-48.7
B112	15.2	22.0	11.0	NE	69.0	NE	37.0	-6.8	NE	-17.8	NE	-86.8	-123.8	-141.8
B113	15.8	27.0	11.0	NE	70.0	NE	20.0	-11.2	NE	-22.2	NE	-92.2	-112.2	-138.2
B114	16.5	16.0	17.0	NE	88.0	NE	15.0	0.5	NE	-16.5	NE	-104.5	-119.5	-133.5
B115	16.4	56.0	NE	NE	ND	ND	ND	NE	NE	-39.6	ND	ND	ND	-59.6

NOTES:
1. ELEVATIONS REFER TO BOSTON CITY BASE DATUM.
2. NE = NOT ENCOUNTERED.
ND = NOT DETERMINED.

HBC ASSOCIATES
FAN PIER DEVELOPMENT
SOUTH BOSTON, MA

FILE NO. 5556
HALEY & ALDRICH, INC.

TABLE 1 (CON'T)
SUMMARY OF SUBSURFACE DATA

TEST BORING	GROUND SURFACE EL.	THICKNESS OF STRATUM (FT)						ELEVATION TOP OF STRATUM						ELEV. BOTTOM OF BORING
		FILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ROCK	
B116	15.6	17.0	6.0	4.0	103.0	NE	3.0	-1.4	-7.4	-11.4	NE	-114.4	-117.4	-138.4
B117	15.3	27.0	2.5	NE	65.5	18.0	10.0	-11.7	NE	-14.2	-79.7	-97.7	-107.7	-128.7
B118	15.8	22.5	NE	4.5	81.5	NE	8.5	NE	-6.7	-11.2	NE	-92.7	-101.2	-118.2
B119	15.9	48.0	NE	NE	ND	ND	ND	NE	NE	-32.1	ND	ND	ND	-55.6
B120	16.3	23.0	NE	4.0	91.0	NE	11.5	NE	-6.7	-10.7	NE	-101.7	-113.2	-127.7
B121	-17.9	NE	7.5	NE	52.0	3.1	ND	-17.9	NE	-25.4	-77.4	-80.5	ND	-84.9
B122	-14.3	12.5	NE	NE	55.6	2.4	ND	NE	NE	-26.8	-82.4	-84.8	ND	-89.8
B123	-30.2	NE	6.0	NE	45.0	NE	ND	-30.2	NE	-36.2	NE	-81.2	ND	-87.2
B124	-24.2	NE	5.0	NE	49.0	NE	ND	-24.2	NE	-29.2	NE	-78.2	ND	-86.2
B125	-4.5	NE	2.0	9.0	ND	ND	ND	-4.5	-6.5	-15.5	ND	ND	ND	-38.5
B126	-1.2	NE	4.0	8.0	ND	ND	ND	-1.2	-5.2	-13.2	ND	ND	ND	-33.2
B127	-14.7	NE	1.0	NE	62.0	NE	ND	-14.7	NE	-15.7	NE	-77.7	ND	-86.7
B128	-27.7	NE	7.0	NE	48.5	NE	ND	-27.7	NE	-34.7	NE	-83.2	ND	-90.7
B129	16.9	52.0	NE	NE	42.0	14.0	ND	NE	NE	-35.1	-77.1	-91.1	ND	-99.6
B312	17.2	24.0	NE	9.8	99.6	NE	10.6	NE	-6.8	-16.6	NE	-116.2	-126.8	-151.3

NOTES:
1. ELEVATIONS REFER TO BOSTON CITY BASE DATUM.
2. NE = NOT ENCOUNTERED.
   ND = NOT DETERMINED.

TABLE 1 (CON'T)
SUMMARY OF SUBSURFACE DATA

TEST BORING	GROUND SURFACE EL.	THICKNESS OF STRATUM (FT)						ELEVATION TOP OF STRATUM						ELEV. BOTTOM OF BORING
		FILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ROCK	
B313	16.4	19.0	5.0	6.5	109.5	NE	8.5	-2.6	-7.6	-14.1	NE	-123.6	-132.1	-147.6
B314	16.6	15.0	2.0	7.0	ND	ND	ND	1.6	-0.4	-7.4	ND	ND	ND	-44.4
G1	15.8	3.0	18.0	2.5	100.0	NE	15.5	12.8	-5.2	-7.7	NE	-107.7	-123.2	-127.2
G2	15.4	4.0	14.0	8.0	103.0	NE	7.0	11.4	-2.6	-10.6	NE	-113.6	-120.6	-125.6
G3	16.2	4.0	21.5	NE	103.5	NE	9.0	12.2	NE	-9.3	NE	-112.8	-121.8	-124.8
G4	16.3	3.5	20.5	NE	92.0	NE	5.0	12.8	NE	-7.7	NE	-99.7	-104.7	-106.7
G5	15.6	20.0	8.0	NE	101.5	NE	7.5	-4.4	NE	-12.4	NE	-113.9	-121.4	-122.4
G6	14.7	20.0	4.0	2.5	103.0	NE	ND	-5.3	-9.3	-11.8	NE	-114.8	ND	-119.8
G7	16.4	7.0	7.0	12.0	94.0	NE	ND	9.4	2.4	-9.6	NE	-103.6	ND	-114.6
G8	17.4	8.0	30.0	NE	62.0	NE	ND	9.4	NE	-20.6	NE	-82.6	ND	-101.1
B1	17.9	24.0	9.0	9.0	64.0	NE	34.0	-6.1	-15.1	-24.1	NE	-88.1	-122.1	-122.3
B2	17.7	26.0	25.0	NE	58.0	NE	11.5	-8.3	NE	-33.3	NE	-91.3	-102.8	-103.3
B3	16.7	24.0	NE	7.0	91.0	NE	16.0	NE	-7.3	-14.3	NE	-105.3	-121.3	-123.5
B4	14.5	25.0	NE	3.0	100.0	NE	3.0	NE	-10.5	-13.5	NE	-113.5	-116.5	-127.5
RC1	18.8	20.0	15.0	9.0	61.0	NE	28.0	-1.2	-16.2	-25.2	NE	-86.2	-114.2	-124.2

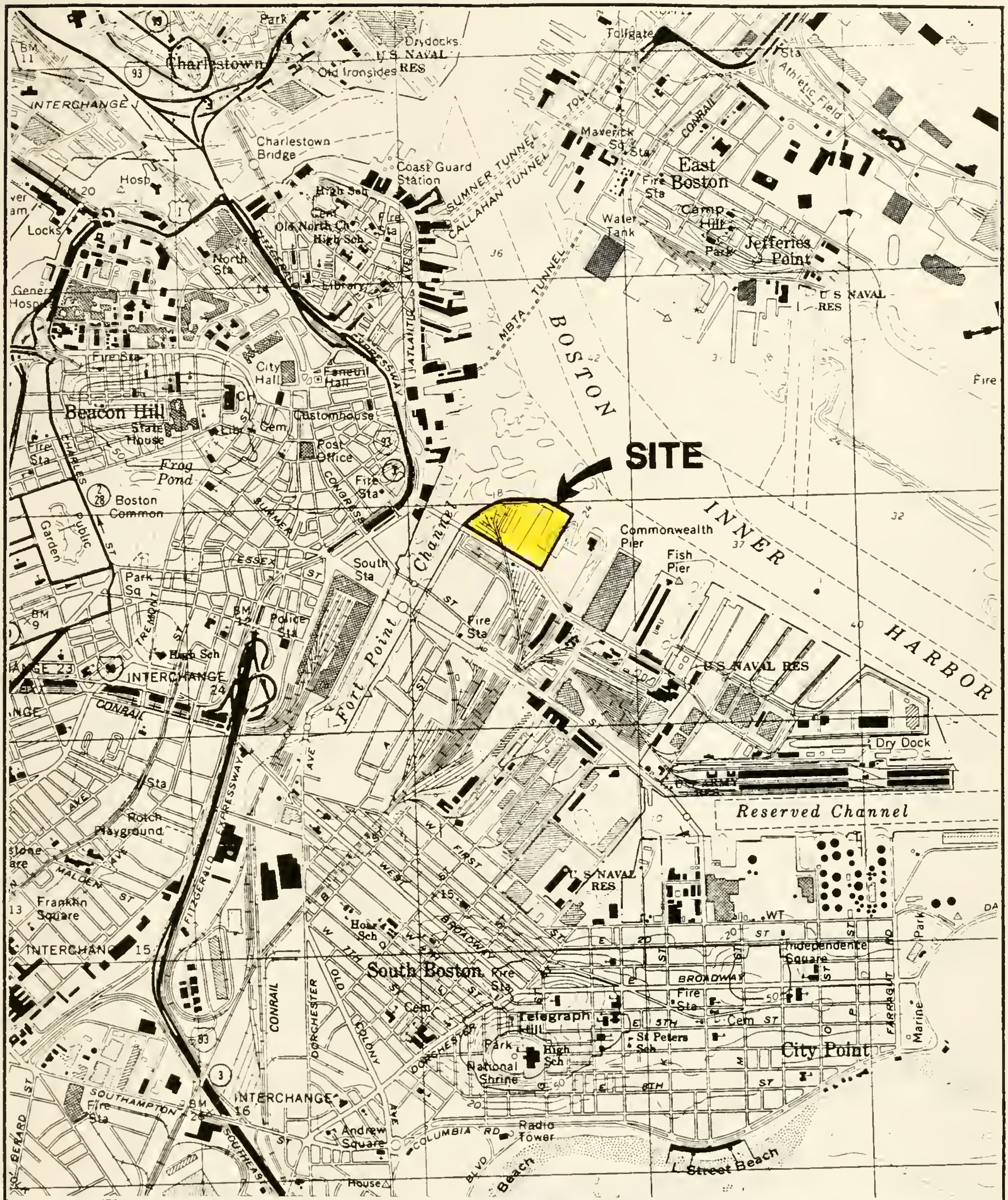
NOTES:
1. ELEVATIONS REFER TO BOSTON CITY BASE DATUM.
2. NE = NOT ENCOUNTERED.
   ND = NOT DETERMINED.

TABLE 1 (CON'T)
SUMMARY OF SUBSURFACE DATA

TEST BORING	GROUND SURFACE EL.	THICKNESS OF STRATUM (FT)						ELEVATION TOP OF STRATUM						ELEV. BOTTOM OF BORING
		FILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ORGANIC SOIL	MARINE SAND	CLAY	GLACIAL OUTWASH	GLACIAL TILL	ROCK	
RC2	18.5	20.0	10.0	11.5	78.0	NE	11.0	-1.5	-11.5	-23.0	NE	-101.0	-112.0	-141.5
RC3	18.2	35.0	NE	5.0	63.5	NE	21.5	NE	-16.8	-21.8	NE	-85.3	-106.8	-131.8
RC4	18.7	27.0	NE	8.0	59.5	NE	27.5	NE	-8.3	-16.3	NE	-75.8	-103.3	-108.3
RC5	19.1	30.0	4.0	NE	94.0	NE	15.0	-10.9	NE	-14.9	NE	-108.9	-123.9	-135.9
RC6	17.3	26.0	NE	9.0	84.0	NE	NE	NE	-8.7	-17.7	NE	NE	-101.7	-121.7
AP4	-27.4	NE	8.0	NE	56.0	NE	ND	-27.4	NE	-35.4	NE	-91.4	ND	-97.4

NOTES:
1. ELEVATIONS REFER TO BOSTON CITY BASE DATUM.
2. NE = NOT ENCOUNTERED.
   ND = NOT DETERMINED.

Figures



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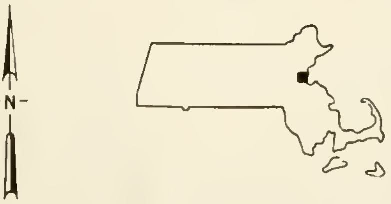


U.S.G.S. QUADRANGLE: BOSTON SOUTH, MA

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS
CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS AND HYDROGEOLOGISTS

HBC ASSOCIATES
FAN PIER DEVELOPMENT
SOUTH BOSTON, MASSACHUSETTS

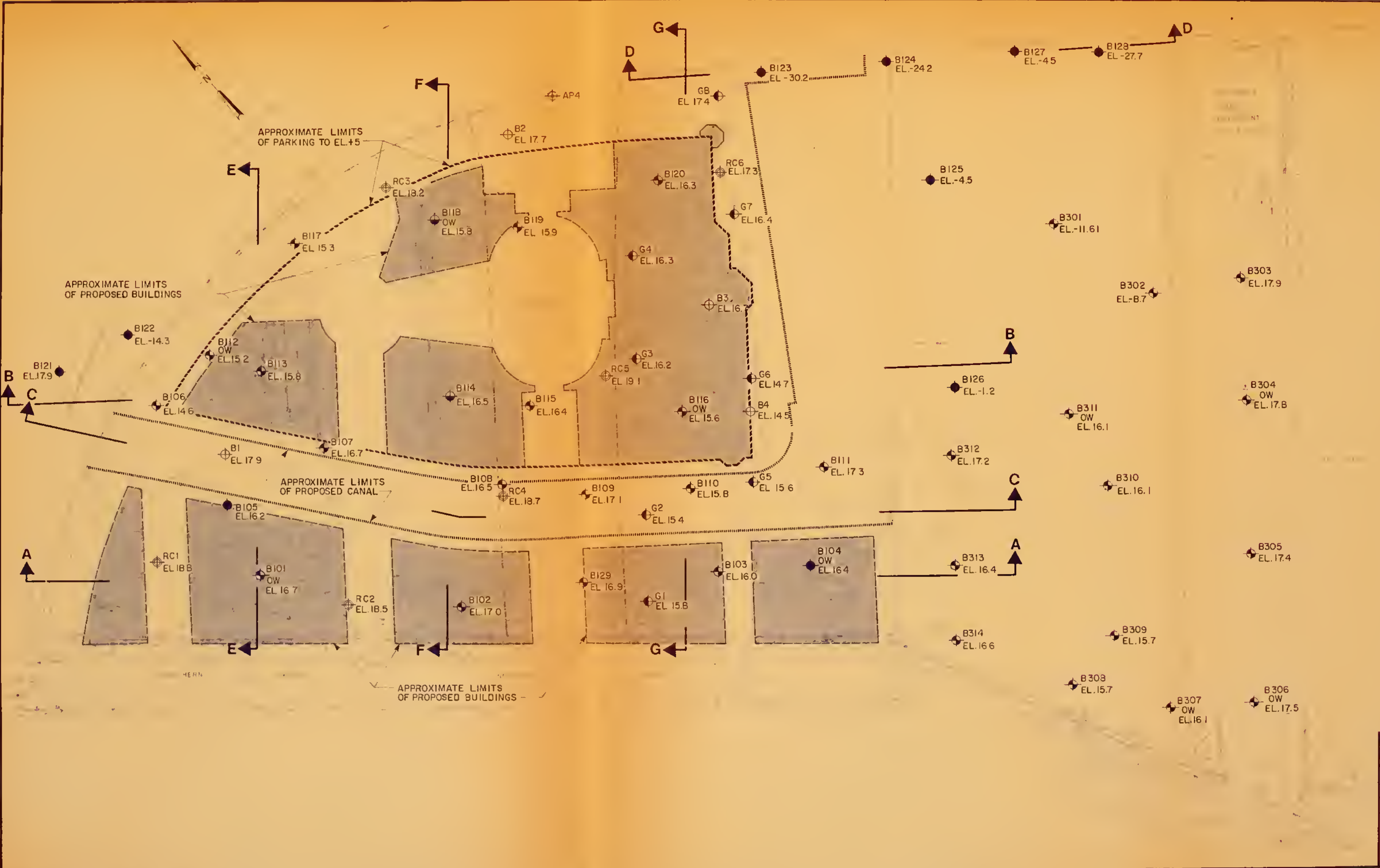
PROJECT LOCUS

APPROX. SCALE 1:25,000

JANUARY 1966

FILE NO. 5556 A22

FIGURE 1



LEGEND:

B101 EL 16.7 LOCATION OF 3-IN. DIAMETER TEST BORING, COMPLETED BY THE GUILD DRILLING CO., INC. SEPTEMBER THROUGH NOVEMBER 1985. LOGS PRESENTED IN APPENDIX C.

B114 EL 16.5 LOCATION OF 4-IN. DIAMETER TEST BORING, COMPLETED BY THE GUILD DRILLING CO., INC. SEPTEMBER THROUGH NOVEMBER 1985. LOGS PRESENTED IN APPENDIX C.

B122 EL-14.3 LOCATION OF 3-IN. DIAMETER TEST BORING, COMPLETED OVER WATER BY THE GUILD DRILLING CO., INC. SEPTEMBER THROUGH OCTOBER 1985. LOGS PRESENTED IN APPENDIX C.

B1 EL 17.9 LOCATION OF 2-1/2 IN. DIAMETER STANDARD TEST BORINGS COMPLETED BY RAYMOND CONCRETE PILE DIVISION DURING JULY-AUGUST 1970. LOGS PRESENTED IN APPENDIX A.

RC3 EL 18.2 LOCATION OF TEST BORINGS IN WHICH NX ROCK CORES OF BEDROCK WERE OBTAINED USING CHRISTENSEN BARREL. BORINGS MADE BY RAYMOND CONCRETE PILE DIVISION DURING JULY-AUGUST 1970. LOGS PRESENTED IN APPENDIX A.

G1 EL 15.8 LOCATION OF 3-1/2 IN. DIAMETER TEST BORING WITH UNDISTURBED PISTON TUBE SAMPLES COMPLETED BY ATLANTIC TEST BORING CO. DURING MARCH 1969. LOG PRESENTED IN APPENDIX A.

AP4 LOCATION OF 2-1/2 IN. DIAMETER STANDARD TEST BORINGS TO REFUSAL BY C.L. GUILD CONST. CO. DURING DECEMBER 1964 IN APPENDIX A.

A A LOCATION OF SUBSURFACE PROFILE

APPROXIMATE LIMITS OF PROPOSED CANAL

NOTES:

1. THIS DRAWING WAS PREPARED FROM A 50 SCALE PLAN PREPARED BY SURVEY ENGINEERING OF BOSTON DATED NOVEMBER 1985 AND ENTITLED "TOPOGRAPHIC PLAN OF LAND IN BOSTON, MA. SOUTH BOSTON DISTRICT. DRAWING NO. 7.11L".
2. ELEVATIONS ARE IN FEET AND REFER TO BOSTON CITY BASE (BCB) WHEREIN EL. 0.00 (BCB) IS 5.65 FT. BELOW NATIONAL GEODETIC VERTICAL DATUM (NGVD).
3. TECHNICAL MONITORING OF THE "B100" AND "B300" SERIES SUBSURFACE EXPLORATIONS WAS PROVIDED BY HALEY & ALDRICH, INC.
4. AS-DRILLED PLAN LOCATIONS OF THE "B100" AND "B300" SERIES TEST BORINGS WERE ESTABLISHED IN THE FIELD BY MEASUREMENTS FROM EXISTING STRUCTURES AND TOPOGRAPHIC FEATURES. LOCATIONS OF THE REMAINING BORINGS SHOWN WERE SCALED AND DRAWN BASED ON AVAILABLE DOCUMENTATION BY OTHERS.
5. REFER TO FIGURES 3 THROUGH 9 FOR SUBSURFACE PROFILES A-A THROUGH G-G.
6. REFER TO FIGURES 10 THROUGH 12 FOR ELEVATION CONTOURS OF TOP OF NATURAL INORGANIC SOIL, TOP OF GLACIAL TILL AND TOP OF BEDROCK, RESPECTIVELY.

0 125 250

SCALE IN FEET

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS
CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS AND HYDROGEOLOGISTS

HBC ASSOCIATES
FAN PIER DEVELOPMENT
SOUTH BOSTON, MASSACHUSETTS

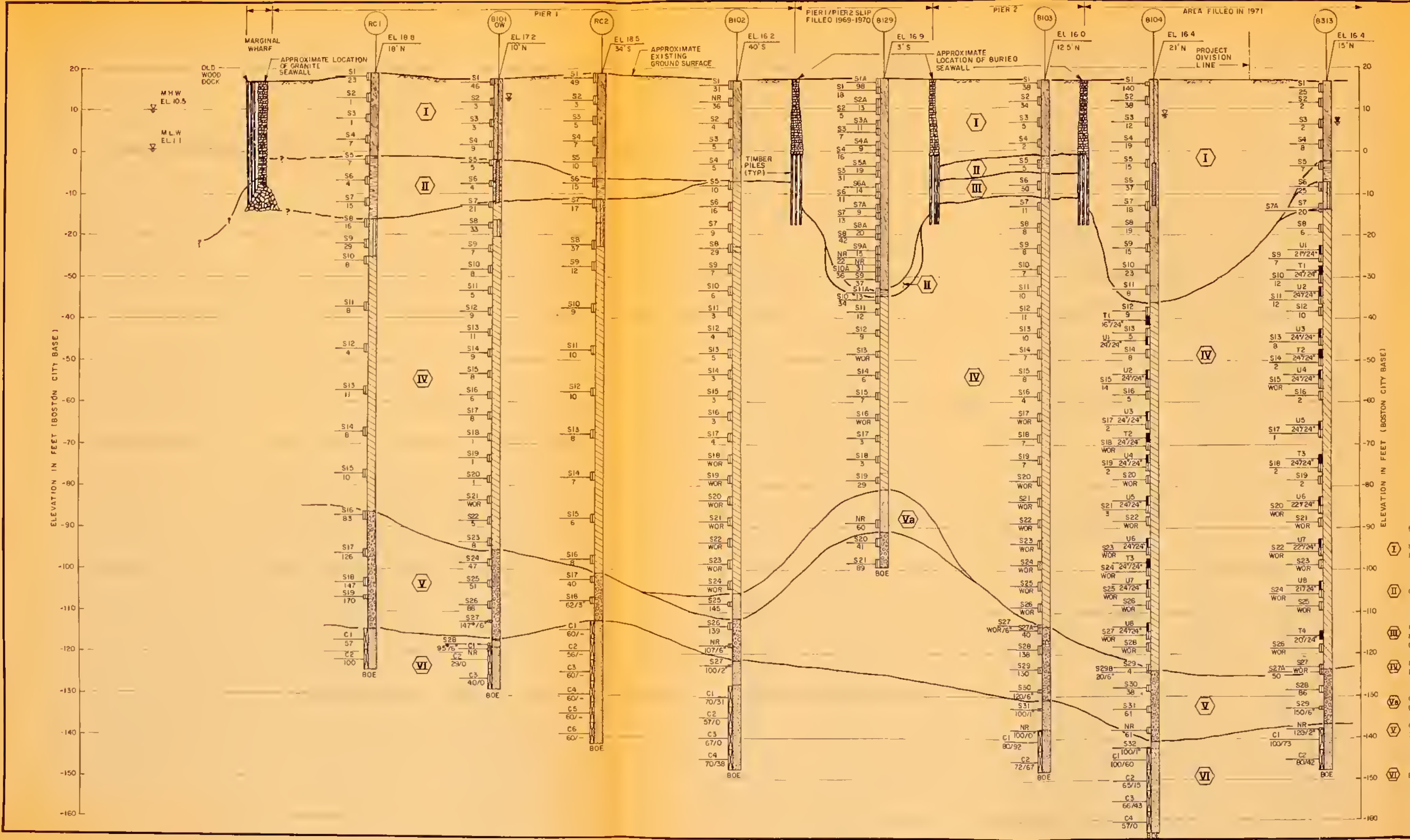
SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN

MARCH 1986

FIGURE 2

FILE NO. 5556



LEGEND:

(B114) BORING NUMBER

EL 16.5 GROUND SURFACE ELEVATION

15' S OFFSET OF BORING FROM LINE OF SUBSURFACE PROFILE (SEE NOTES)

WATER LEVEL OBSERVED IN OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE

WATER LEVEL OBSERVED IN COMPLETED BOREHOLE

LOCATION OF OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE

S10 / 15 LOCATION OF 1-3/8 INCH I.D. SPLIT SPOON SAMPLE, OBTAINED BY DRIVING THE SPLIT SPOON SAMPLER WITH A 140- LB. HAMMER, 30-INCH DROP, NUMBERS INDICATE BLOWS PER 12 INCHES OR THE "N" VALUE, UNLESS OTHERWISE NOTED (SEE NOTE 6)

WOR - WEIGHT OF RODS PER 6 INCHES
100/3" - 100 BLOWS, 3 INCHES OF PENETRATION
20*/2" - 20 BLOWS WITH 300 LB. HAMMER,
2 INCHES OF PENETRATION

S10A / 4 LOCATION OF A 2-INCH I.D. SPLIT SPOON SAMPLE, OBTAINED BY DRIVING THE SPLIT SPOON SAMPLER WITH A 140- LB. HAMMER, 30-INCH DROP, NUMBERS INDICATE BLOWS PER 12 INCHES, UNLESS NOTED OTHERWISE

T2 / 22"/24" LOCATION OF A 2-INCH DIAMETER SHELBY PISTON TUBE SAMPLE. SAMPLE RECOVERY 22 INCHES OUT OF 24 INCHES PRESSED

U2 / 24"/24" LOCATION OF 3-INCH DIAMETER STATIONARY PISTON TUBE SAMPLE. SAMPLE RECOVERY 24 INCHES OUT OF 24 INCHES

NR NO RECOVERY

C1 / 75/44 LOCATION OF 1-5/8-INCH DIAMETER ROCK CORE. NUMBERS INDICATE PERCENT CORE RECOVERY/PERCENT RQD (SEE NOTE 7)

APPROXIMATE LOCATION OF STRATA CHANGE

BOE BOTTOM OF EXPLORATION

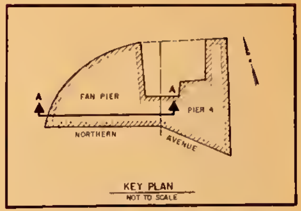
R REFUSAL

GENERALIZED STRATA DESCRIPTIONS

	MAJOR STRATA	SYMBOL	GENERAL DESCRIPTION
I	MISCELLANEOUS FILL	▨	LOOSE TO MEDIUM COMPACT UNSORTED MIXTURE OF SAND, GRAVEL, SILT, CLAY, WOOD, BRICK, CINDERS, GLASS, GRANITE BLOCKS, CONCRETE ETC., OCCASIONALLY MIXED WITH ORGANIC SOILS.
II	ORGANIC SOILS	▤	SOFT TO VERY SOFT BLACK ORGANIC SILT WITH SHELLS AND BLACK FIBROUS SALT MARSH PEAT TO PEATY ORGANIC SILT.
III	NEARSHORE MARINE DEPOSITS	▥	LOOSE TO MEDIUM DENSE BROWN TO BLACK FINE SAND AND SILTY FINE SAND.
IV	BOSTON BLUE CLAY	▧	MEDIUM STIFF TO STIFF GRAY SILTY CLAY, TRACE FINE SAND WITH OCCASIONAL LAYERS OF SILT AND SILTY FINE SAND
Va	OUTWASH DEPOSITS	☐	DENSE TO VERY DENSE GRAY MEDIUM TO FINE SAND AND GRAVEL.
V	GLACIAL TILL	▩	DENSE TO VERY DENSE, GRAY SILTY COARSE TO FINE SAND, LITTLE GRAVEL, COBBLES AND OCCASIONAL BOULDERS, WITH VARIATIONS TO GRAY CLAYEY SAND OR SANDY SILT, LITTLE GRAVEL, COBBLES AND BOULDERS.
VI	BEDROCK	⬚	VARIES FROM VERY SOFT, WEATHERED TO MODERATE HARD SOUND, UNALTERED CAMBRIDGE ARGILLITE, MODERATELY TO HIGHLY FRACTURED.

NOTES:

1. ELEVATIONS ARE IN FEET AND REFER TO BOSTON CITY BASE (BCB). EL. 0.0 BCB = EL. -5.65 NATIONAL GEODETIC VERTICAL DATUM (NGVD).
2. LINES REPRESENTING CHANGES IN STRATA ARE BASED UPON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
3. REFER TO APPENDIX C FOR LOGS OF RECENT TEST BORINGS, TO APPENDIX A FOR LOGS OF PREVIOUS TEST BORINGS, AND TO APPENDIX D FOR GROUNDWATER OBSERVATION WELL INSTALLATION AND MONITORING REPORTS.
4. MUDLINE ELEVATIONS INDICATED WERE OBTAINED FROM BATHYMETRIC SURVEYS CONDUCTED BY JASON M. CORTELL ASSOCIATES, WALTHAM, MASSACHUSETTS.
5. OFFSET DISTANCES INDICATED ARE PERPENDICULAR TO THE PLAN LOCATION OF THE SUBSURFACE PROFILE LINE. DIRECTIONS NORTH AND SOUTH ARE ASSUMED TO BE PERPENDICULAR TO THE PROFILE LINE.
6. THE STANDARD PENETRATION RESISTANCE, N, IS DEFINED AS THE NUMBER OF BLOWS OF A 140-LB. HAMMER FALLING FREELY THROUGH A VERTICAL DISTANCE OF 30 INCHES REQUIRED TO DRIVE A 2-INCH O.D., 1-3/8-INCH I.D. SPLIT SPOON SAMPLER 12 INCHES. THE SAMPLER IS NORMALLY DRIVEN 3 (FOR 18-INCH LONG SAMPLER) OR 4 (FOR 24 INCH LONG SAMPLER) SUCCESSIVE 6-INCH INCREMENTS. THE TOTAL NUMBER OF BLOWS REQUIRED TO ADVANCE THE SAMPLER FROM THE 6 TO 18 INCH SAMPLING INTERVAL IS THE STANDARD PENETRATION RESISTANCE, N.
7. RQD REFERS TO ROCK QUALITY DESIGNATION, WHICH IS DEFINED AS THE SUM IN INCHES OF ALL THE PIECES OF ROCK CORE 4 INCHES OR LONGER, DIVIDED BY THE LENGTH IN INCHES OF THE CORE RUN, AND IS EXPRESSED AS A PERCENTAGE.
8. REFER TO FIGURE 2 FOR PLAN LOCATION OF PROFILES.
9. REFER TO REPORT TEXT FOR GENERALIZED STRATA DESCRIPTIONS.
10. REFER TO TEST BORING LOGS FOR DETAILED SOIL DESCRIPTIONS.
11. LOCATION AND GEOMETRY OF BURIED SEAWALLS AND WHARFS ARE APPROXIMATE. THESE LOCATIONS ARE BASED ON AVAILABLE INFORMATION THAT HAS NOT BEEN VERIFIED IN THE EXPLORATION PROGRAM.



KEY PLAN
NOT TO SCALE

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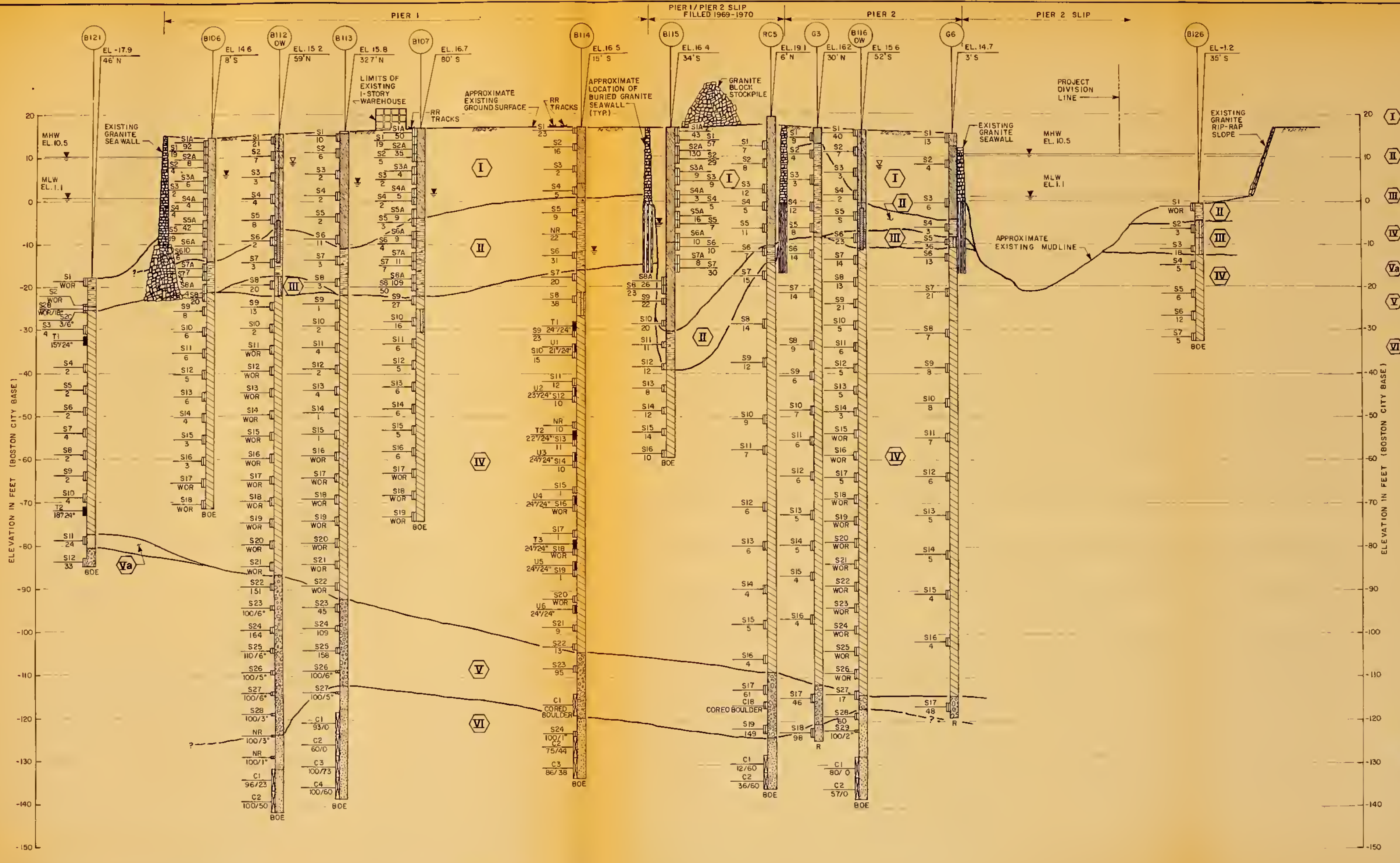
SOUTH BOSTON, MASSACHUSETTS

SUBSURFACE PROFILE A-A

SCALE: AS SHOWN
MARCH 1988

FIGURE 3

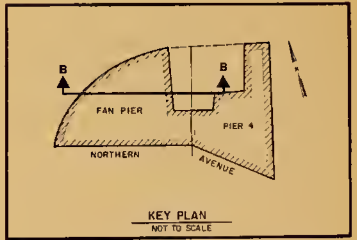
FILE NO 5556



GENERALIZED STRATA DESCRIPTIONS

	MAJOR STRATA	SYMBOL	GENERAL DESCRIPTION
I	MISCELLANEOUS FILL	▨	LOOSE TO MEDIUM COMPACT UNSORTED MIXTURE OF SAND, GRAVEL, SILT, CLAY, WOOD, BRICK, CINDERS, GLASS, GRANITE BLOCKS, CONCRETE ETC., OCCASIONALLY MIXED WITH ORGANIC SOILS.
II	ORGANIC SOILS	▤	SOFT TO VERY SOFT BLACK ORGANIC SILT WITH SHELLS AND BLACK FIBROUS SALT MARSH PEAT TO PEATY ORGANIC SILT.
III	NEARSHORE MARINE DEPOSITS	▥	LOOSE TO MEDIUM DENSE BROWN TO BLACK FINE SAND AND SILTY FINE SAND.
IV	BOSTON BLUE CLAY	▧	MEDIUM STIFF TO STIFF GRAY SILTY CLAY, TRACE FINE SAND WITH OCCASIONAL LAYERS OF SILT AND SILTY FINE SAND.
Va	OUTWASH DEPOSITS	▨	DENSE TO VERY DENSE GRAY MEDIUM TO FINE SAND AND GRAVEL.
V	GLACIAL TILL	▨	DENSE TO VERY DENSE, GRAY SILTY COARSE TO FINE SAND, LITTLE GRAVEL, COBBLES AND OCCASIONAL BOULDERS; WITH VARIATIONS TO GRAY CLAYEY SAND OR SANDY SILT, LITTLE GRAVEL, COBBLES AND BOULDERS.
VI	BEDROCK	▨	VARIES FROM VERY SOFT, WEATHERED TO MODERATE HARD SOUND, UNALTERED CAMBRIDGE ARGILLITE, MODERATELY TO HIGHLY FRACTURED.

NOTE
REFER TO FIGURE 3 FOR LEGEND AND NOTES.



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SUBSURFACE PROFILE B-B

SCALE: AS SHOWN
MARCH 1986

FIGURE 4

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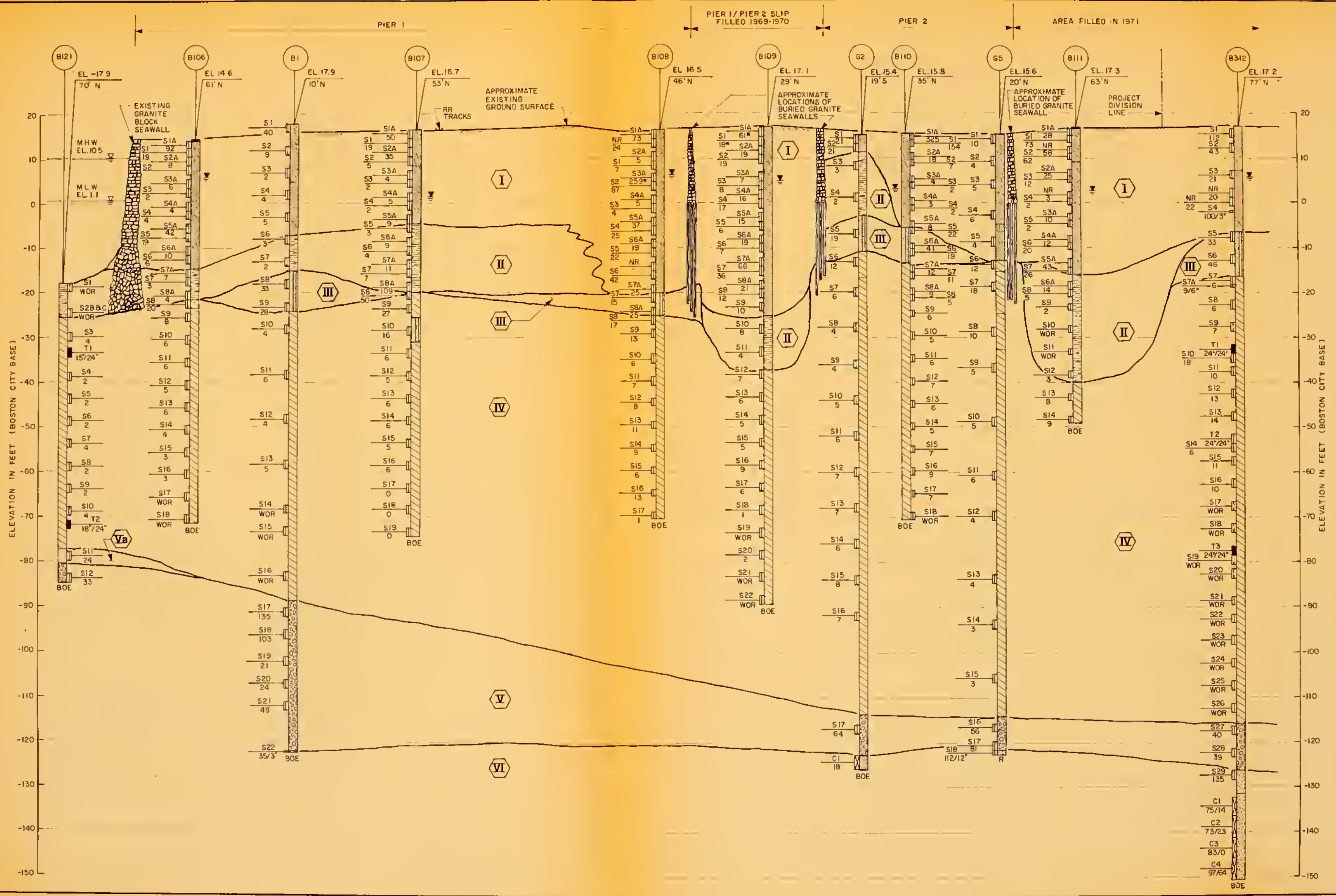
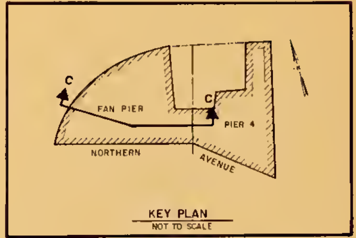
FILE NO. 5556



GENERALIZED STRATA DESCRIPTIONS

	MAJOR STRATA	SYMBOL	GENERAL DESCRIPTION
I	MISCELLANEOUS FILL	☐	LOOSE TO MEDIUM COMPACT UNSORTED MIXTURE OF SAND, GRAVEL, SILT, CLAY, WOOD, BRICK, CINDERS, GLASS, GRANITE BLOCKS, CONCRETE ETC., OCCASIONALLY MIXED WITH ORGANIC SOILS.
II	ORGANIC SOILS	▤	SOFT TO VERY SOFT BLACK ORGANIC SILT WITH SHELLS AND BLACK FIBROUS SALT MARSH PEAT TO PEATY ORGANIC SILT.
III	NEARSHORE MARINE DEPOSITS	▥	LOOSE TO MEDIUM DENSE BROWN TO BLACK FINE SAND AND SILTY FINE SAND.
IV	BOSTON BLUE CLAY	▧	MEDIUM STIFF TO STIFF GRAY SILTY CLAY, TRACE FINE SAND WITH OCCASIONAL LAYERS OF SILT AND SILTY FINE SAND.
Va	OUTWASH DEPOSITS	☐	DENSE TO VERY DENSE GRAY MEDIUM TO FINE SAND AND GRAVEL.
V	GLACIAL TILL	▩	DENSE TO VERY DENSE, GRAY SILTY COARSE TO FINE SAND, LITTLE GRAVEL, COBBLES AND OCCASIONAL BOULDERS, WITH VARIATIONS TO GRAY CLAYEY SAND OR SANDY SILT, LITTLE GRAVEL, COBBLES AND BOULDERS.
VI	BEDROCK	▒	VARIES FROM VERY SOFT, WEATHERED TO MODERATE HARD SOUND, UNALTERED CAMBRIDGE ARGILLITE, MODERATELY TO HIGHLY FRACTURED.

NOTE
REFER TO FIGURE 3 FOR LEGEND AND NOTES



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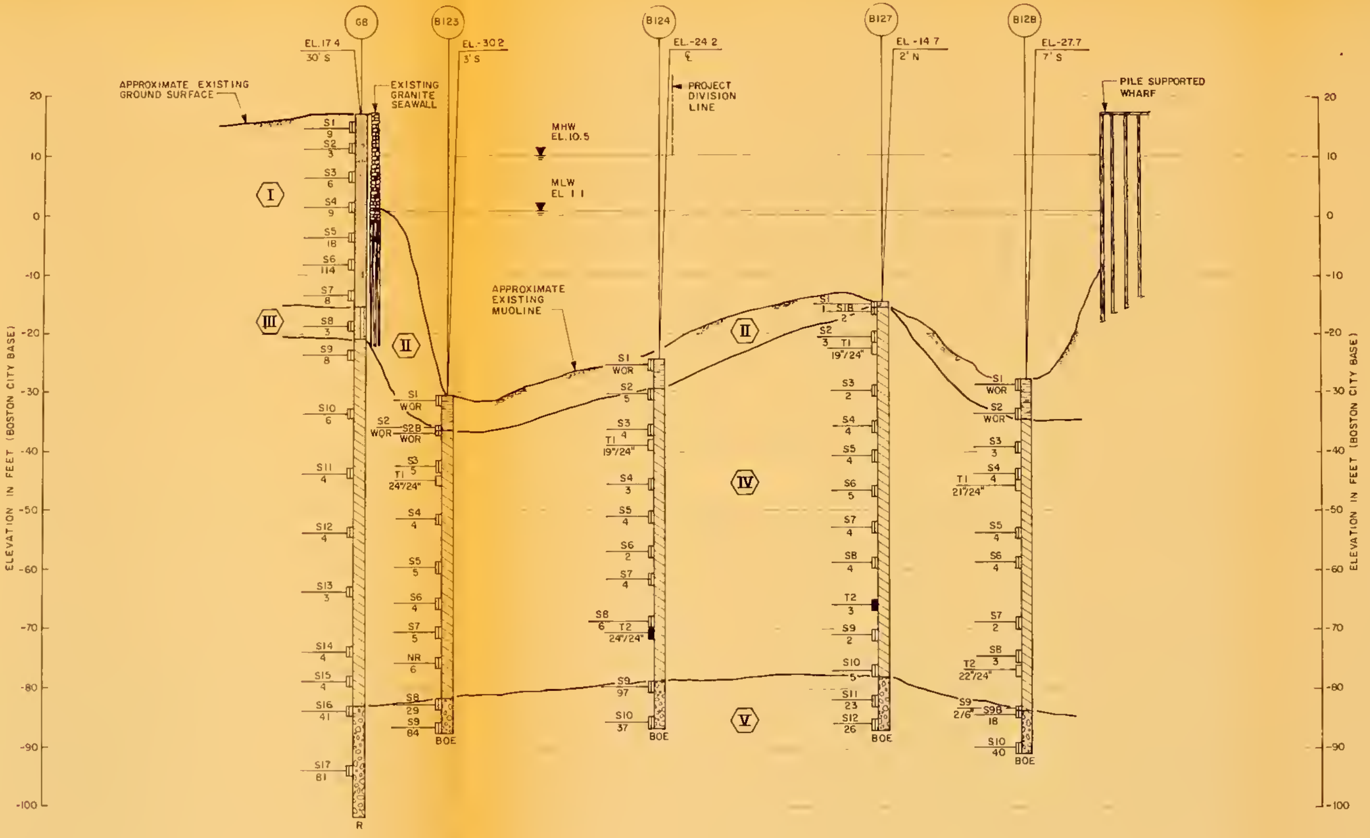
SUBSURFACE PROFILE C-C

SCALE:AS SHOWN
MARCH 1986

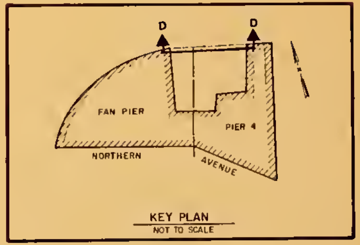
FIGURE 5



GENERALIZED STRATA DESCRIPTIONS

	MAJOR STRATA	SYMBOL	GENERAL DESCRIPTION
I	MISCELLANEOUS FILL	□	LOOSE TO MEDIUM COMPACT UNSORTED MIXTURE OF SAND, GRAVEL, SILT, CLAY, WOOD, BRICK, CINDERS, GLASS, GRANITE BLOCKS, CONCRETE ETC., OCCASIONALLY MIXED WITH ORGANIC SOILS.
II	ORGANIC SOILS	□	SOFT TO VERY SOFT BLACK ORGANIC SILT WITH SHELLS AND BLACK FIBROUS SALT MARSH PEAT TO PEATY ORGANIC SILT.
III	NEARSHORE MARINE DEPOSITS	▥	LOOSE TO MEDIUM DENSE BROWN TO BLACK FINE SAND AND SILTY FINE SAND.
IV	BOSTON BLUE CLAY	▧	MEDIUM STIFF TO STIFF GRAY SILTY CLAY, TRACE FINE SAND WITH OCCASIONAL LAYERS OF SILT AND SILTY FINE SAND.
Va	OUTWASH DEPOSITS	□	DENSE TO VERY DENSE GRAY MEDIUM TO FINE SAND AND GRAVEL.
V	GLACIAL TILL	▩	DENSE TO VERY DENSE, GRAY SILTY COARSE TO FINE SAND, LITTLE GRAVEL, COBBLES AND OCCASIONAL BOULDERS; WITH VARIATIONS TO GRAY CLAYEY SAND OR SANDY SILT, LITTLE GRAVEL, COBBLES AND BOULDERS.
VI	BEDROCK	▒	VARIES FROM VERY SOFT, WEATHERED TO MODERATE HARD SOUND, UNALTERED CAMBRIDGE ARGILLITE, MODERATELY TO HIGHLY FRACTURED.

NOTE:
REFER TO FIGURE 3 FOR LEGEND AND NOTES



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SUBSURFACE PROFILE D-D

SCALE: AS SHOWN
MARCH 1986

FIGURE 6

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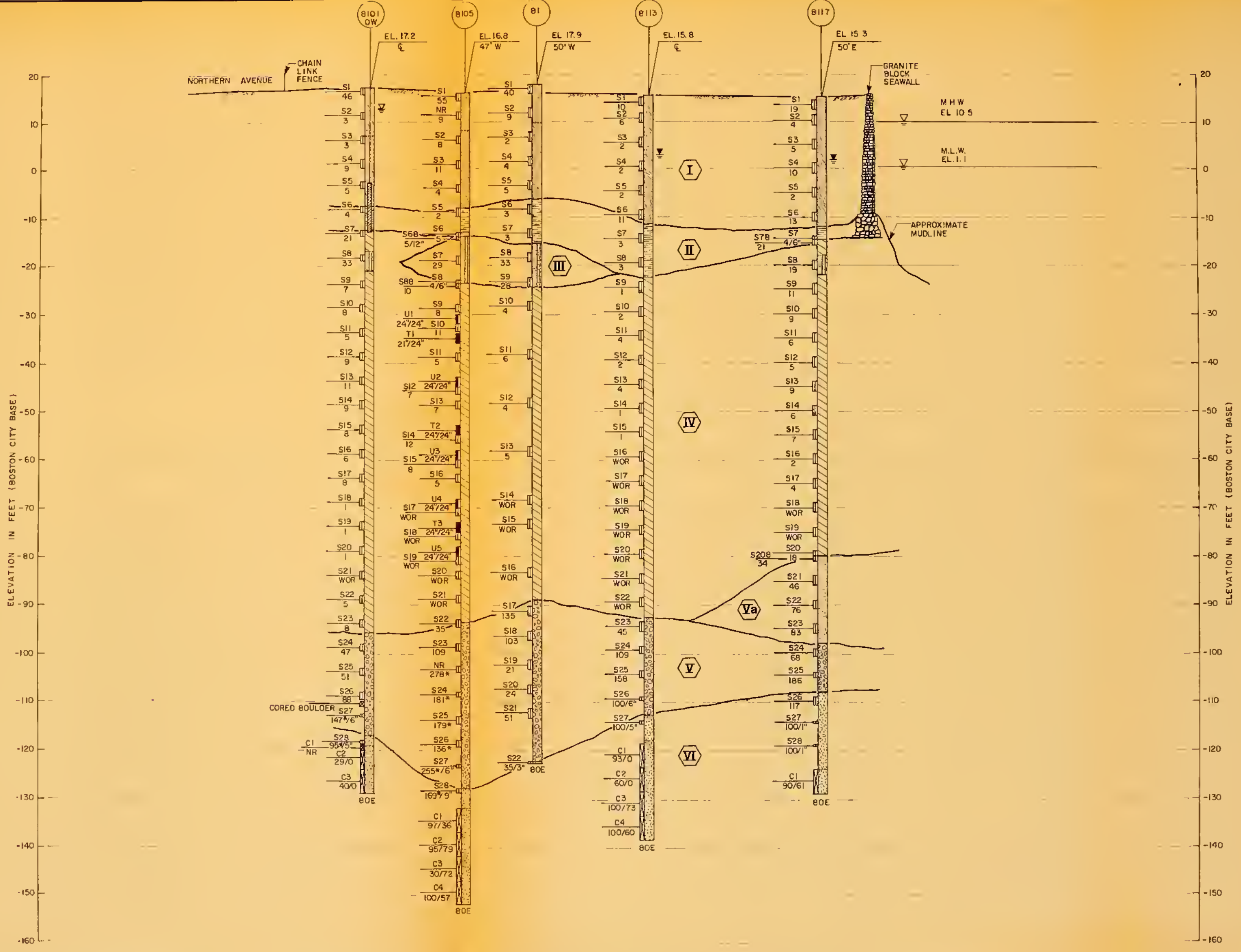
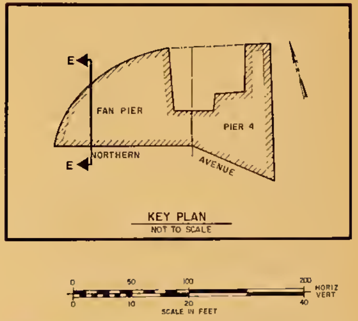


GENERALIZED STRATA DESCRIPTIONS

	MAJOR STRATA	SYMBOL	GENERAL DESCRIPTION
I	MISCELLANEOUS FILL	▨	LOOSE TO MEDIUM COMPACT UNSORTED MIXTURE OF SAND, GRAVEL, SILT, CLAY, WOOD, BRICK, CINDERS, GLASS, GRANITE BLOCKS, CONCRETE ETC., OCCASIONALLY MIXED WITH ORGANIC SOILS.
II	ORGANIC SOILS	▤	SOFT TO VERY SOFT BLACK ORGANIC SILT WITH SHELLS AND BLACK FIBROUS SALT MARSH PEAT TO PEATY ORGANIC SILT.
III	NEARSHORE MARINE DEPOSITS	▥	LOOSE TO MEDIUM DENSE BROWN TO BLACK FINE SAND AND SILTY FINE SAND.
IV	BOSTON BLUE CLAY	▧	MEDIUM STIFF TO STIFF GRAY SILTY CLAY, TRACE FINE SAND WITH OCCASIONAL LAYERS OF SILT AND SILTY FINE SAND.
Va	OUTWASH DEPOSITS	☐	DENSE TO VERY DENSE GRAY MEDIUM TO FINE SAND AND GRAVEL.
V	GLACIAL TILL	▩	DENSE TO VERY DENSE, GRAY SILTY COARSE TO FINE SAND, LITTLE GRAVEL, COBBLES AND OCCASIONAL BOULDERS; WITH VARIATIONS TO GRAY CLAYEY SAND OR SANDY SILT, LITTLE GRAVEL, COBBLES AND BOULDERS.
VI	BEDROCK	▦	VARIES FROM VERY SOFT, WEATHERED TO MODERATE HARD SOUND, UNALTERED CAMBRIDGE ARGILLITE, MODERATELY TO HIGHLY FRACTURED.

NOTE
REFER TO FIGURE 3 FOR LEGEND AND NOTES



KEY PLAN
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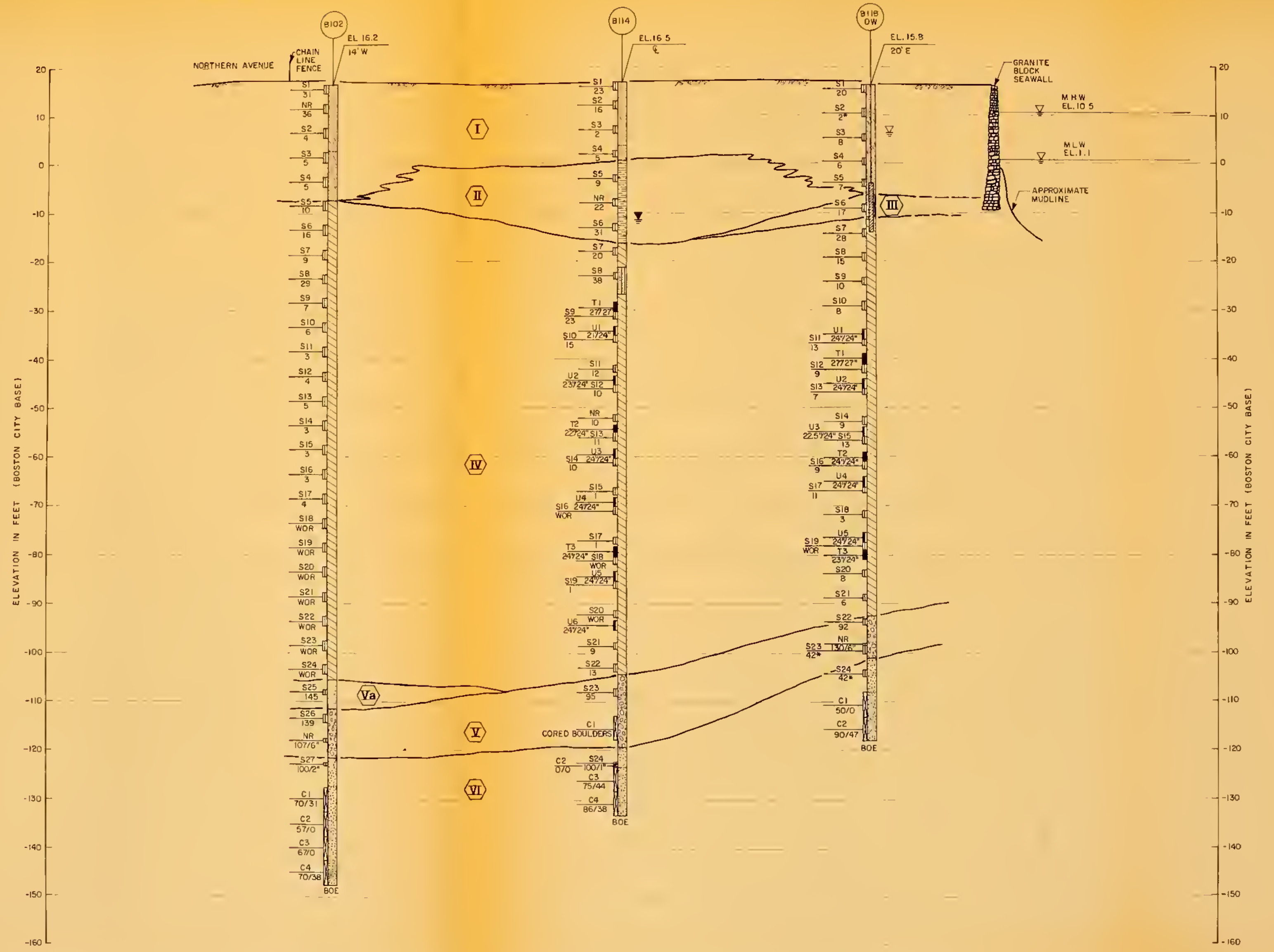
SUBSURFACE PROFILE E-E

SCALE: AS SHOWN
MARCH 1986

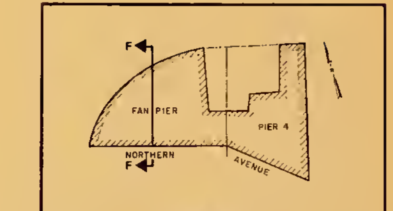
FIGURE 7



GENERALIZED STRATA DESCRIPTIONS

	MAJOR STRATA	SYMBOL	GENERAL DESCRIPTION
I	MISCELLANEOUS FILL	☐	LOOSE TO MEDIUM COMPACT UNSORTED MIXTURE OF SAND, GRAVEL, SILT, CLAY, WOOD, BRICK, CINDERS, GLASS, GRANITE BLOCKS, CONCRETE ETC., OCCASIONALLY MIXED WITH ORGANIC SOILS.
II	ORGANIC SOILS	▤	SOFT TO VERY SOFT BLACK ORGANIC SILT WITH SHELLS AND BLACK FIBROUS SALT MARSH PEAT TO PEATY ORGANIC SILT.
III	NEARSHORE MARINE DEPOSITS	▥	LOOSE TO MEDIUM DENSE BROWN TO BLACK FINE SAND AND SILTY FINE SAND.
IV	BOSTON BLUE CLAY	▨	MEDIUM STIFF TO STIFF GRAY SILTY CLAY, TRACE FINE SAND WITH OCCASIONAL LAYERS OF SILT AND SILTY FINE SAND.
Va	OUTWASH DEPOSITS	☐	DENSE TO VERY DENSE GRAY MEDIUM TO FINE SAND AND GRAVEL.
V	GLACIAL TILL	▩	DENSE TO VERY DENSE, GRAY SILTY COARSE TO FINE SAND, LITTLE GRAVEL, COBBLES AND OCCASIONAL BOULDERS; WITH VARIATIONS TO GRAY CLAYEY SAND OR SANDY SILT, LITTLE GRAVEL, COBBLES AND BOULDERS.
VI	BEDROCK	▒	VARIES FROM VERY SOFT, WEATHERED TO MODERATE HARD SOUND, UNALTERED CAMBRIDGE ARGILLITE, MODERATELY TO HIGHLY FRACTURED.

NOTE:
REFER TO FIGURE 3 FOR LEGEND AND NOTES



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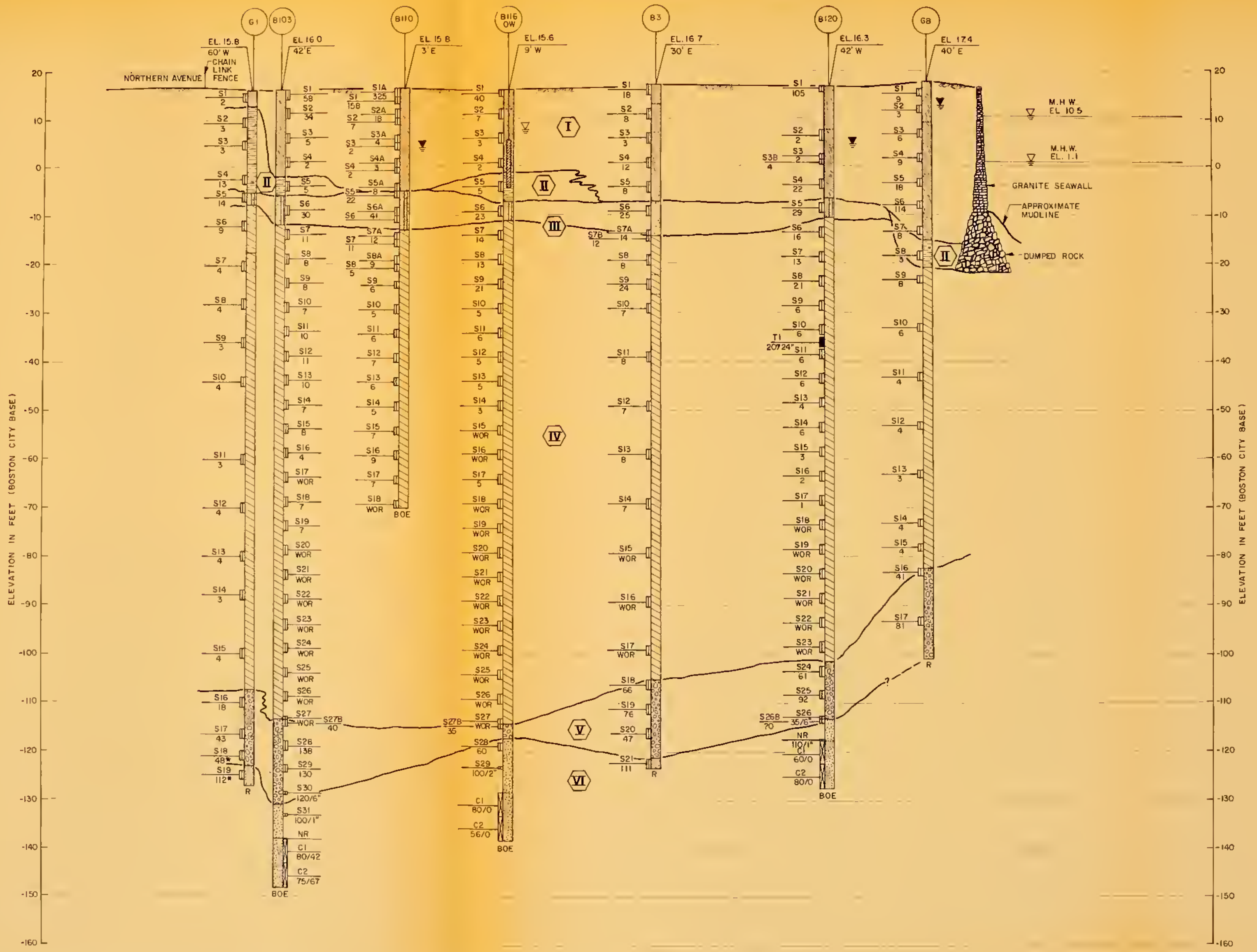
SUBSURFACE PROFILE F-F

SCALE:AS SHOWN
MARCH 1986

FIGURE 8

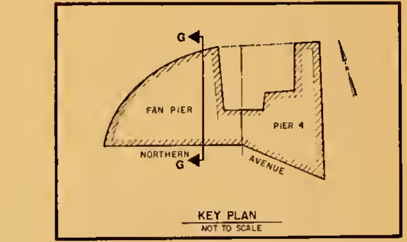
FILE NO. 5556



GENERALIZED STRATA DESCRIPTIONS

	MAJOR STRATA	SYMBOL	GENERAL DESCRIPTION
I	MISCELLANEOUS FILL	▨	LOOSE TO MEDIUM COMPACT UNSORTED MIXTURE OF SAND, GRAVEL, SILT, CLAY, WOOD, BRICK, CINDERS, GLASS, GRANITE BLOCKS, CONCRETE ETC., OCCASIONALLY MIXED WITH ORGANIC SOILS.
II	ORGANIC SOILS	▤	SOFT TO VERY SOFT BLACK ORGANIC SILT WITH SHELLS AND BLACK FIBROUS SALT MARSH PEAT TO PEATY ORGANIC SILT.
III	NEARSHORE MARINE DEPOSITS	▥	LOOSE TO MEDIUM DENSE BROWN TO BLACK FINE SAND AND SILTY FINE SAND.
IV	BOSTON BLUE CLAY	▧	MEDIUM STIFF TO STIFF GRAY SILTY CLAY, TRACE FINE SAND WITH OCCASIONAL LAYERS OF SILT AND SILTY FINE SAND.
Va	OUTWASH DEPOSITS	☐	DENSE TO VERY DENSE GRAY MEDIUM TO FINE SAND AND GRAVEL.
V	GLACIAL TILL	▩	DENSE TO VERY DENSE, GRAY SILTY COARSE TO FINE SAND, LITTLE GRAVEL, COBBLES AND OCCASIONAL BOULDERS; WITH VARIATIONS TO GRAY CLAYEY SAND OR SANDY SILT, LITTLE GRAVEL, COBBLES AND BOULDERS.
VI	BEDROCK	▦	VARIES FROM VERY SOFT, WEATHERED TO MODERATE HARD SOUND, UNALTERED CAMBRIDGE ARGILLITE, MODERATELY TO HIGHLY FRACTURED.

NOTE
REFER TO FIGURE 3 FOR LEGEND AND NOTES



KEY PLAN
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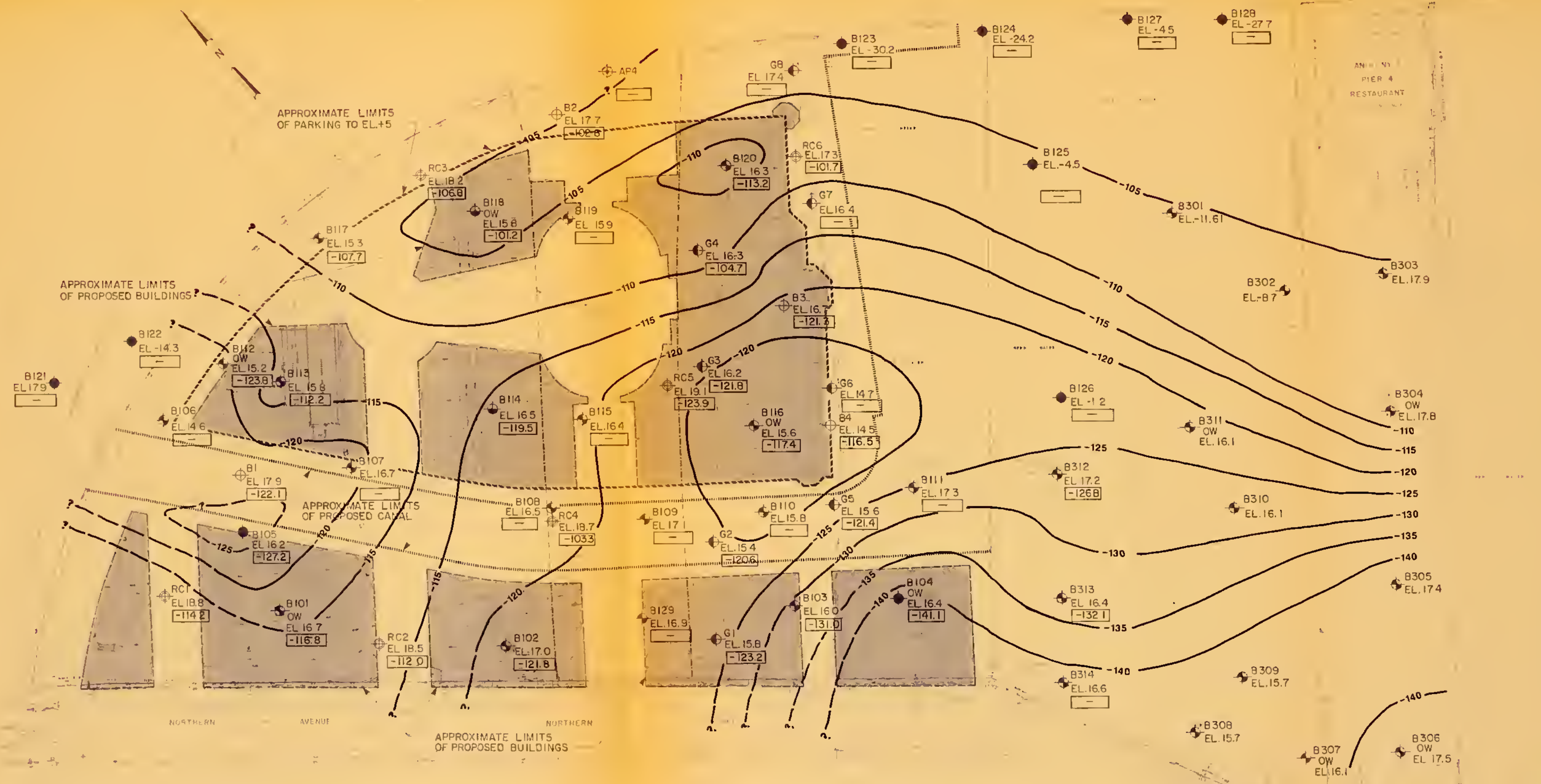
SUBSURFACE PROFILE G-G

SCALE: AS SHOWN
MARCH 1986

FIGURE 9

FILE NO. 5556



LEGEND:

—-20— ELEVATION CONTOUR OF TOP OF BEDROCK.

NOTES:

1. ELEVATION CONTOURS OF TOP OF BEDROCK WERE GENERATED BY LINEAR INTERPOLATION BETWEEN SUBSURFACE EXPLORATIONS
2. TOP OF BEDROCK ELEVATION IS DEFINED AS WHERE A GEOLOGIC CLASSIFICATION OF ROCK WAS NOTED IN INDIVIDUAL TEST BORING LOGS. IT SHOULD BE NOTED THAT THE UPPER SEVERAL FEET OF THE BEDROCK ENCOUNTERED IN SEVERAL BORINGS WAS FOUND TO BE MODERATELY TO SEVERELY WEATHERED.
3. ELEVATION CONTOURS OF TOP OF BEDROCK ARE BASED ON INTERPOLATION OF AVAILABLE DATA PROVIDED BY SUBSURFACE INVESTIGATIONS, AND ARE PRESENTED FOR THE PURPOSE OF INDICATING GENERAL TRENDS. ACTUAL FIELD CONDITIONS MAY VARY FROM THE INDICATED CONTOURS.
4. LOCAL VARIATIONS FROM THE INDICATED CONTOURS SHOULD BE ANTICIPATED.
5. THIS DRAWING WAS PREPARED FROM A 50 SCALE PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON DATED NOVEMBER 1985 AND ENTITLED "TOPOGRAPHIC PLAN OF LAND IN BOSTON, MA. SOUTH BOSTON DISTRICT. DRAWING NO. 7.11L".
6. ELEVATIONS REFER TO BOSTON CITY BASE (BCB) WHEREIN EL. 0.00 (BCB) IS 5.65 FT. BELOW NATIONAL GEODETIC VERTICAL DATUM (NGVD).

0 125 250
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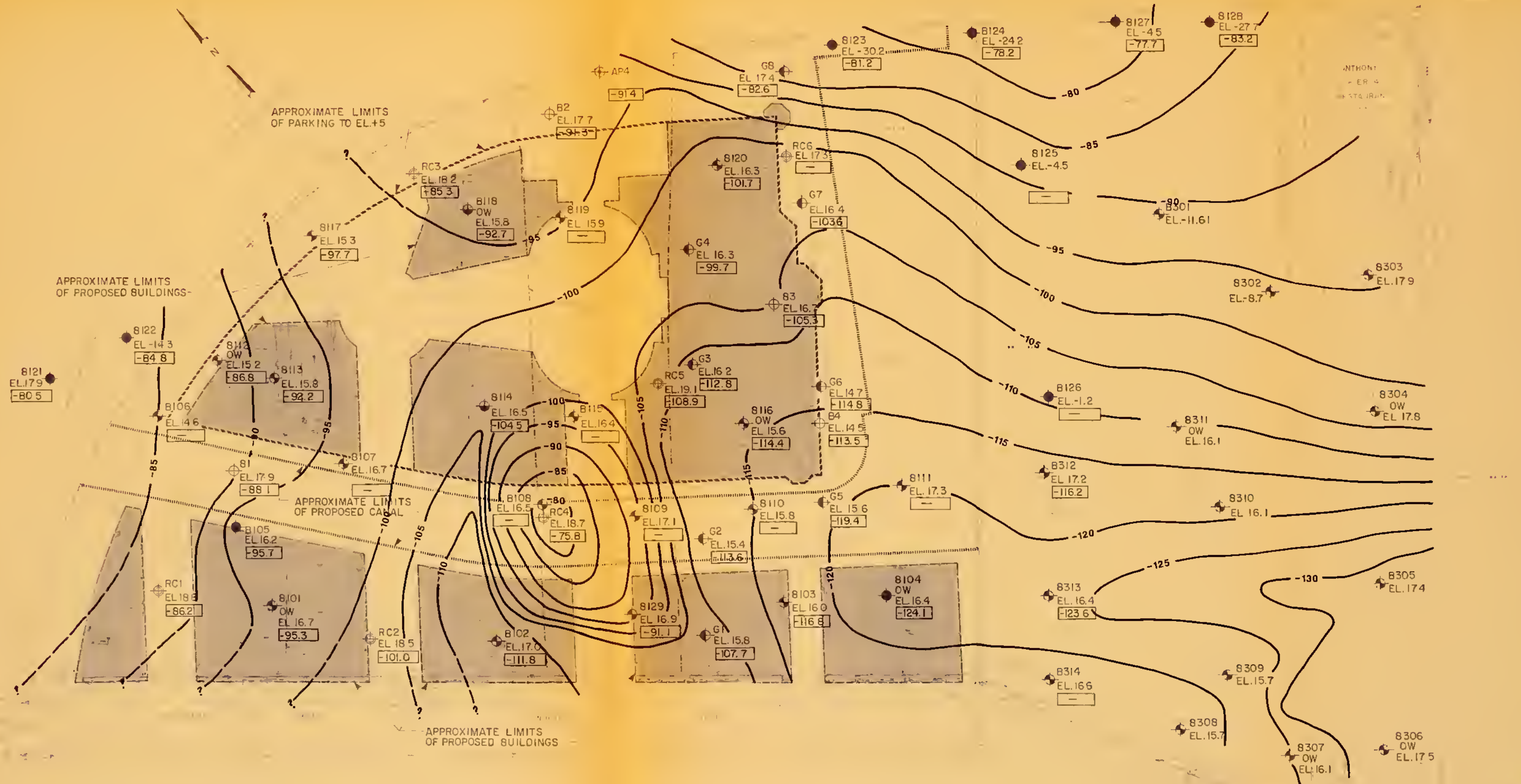
TOP OF BEDROCK ELEVATION CONTOUR PLAN

SCALE:AS SHOWN
MARCH 1986

FIGURE 10

FILE NO. 5556



LEGEND:

-100 ELEVATION CONTOUR OF TOP OF GLACIAL TILL.

NOTES:

1. ELEVATION CONTOURS OF TOP OF GLACIAL TILL WERE GENERATED BY LINEAR INTERPOLATION BETWEEN SUBSURFACE EXPLORATIONS.
2. ELEVATION CONTOURS OF TOP OF GLACIAL TILL ARE BASED ON INTERPOLATION OF AVAILABLE DATA PROVIDED BY SUBSURFACE INVESTIGATIONS, AND ARE PRESENTED FOR THE PURPOSE OF INDICATING GENERAL TRENDS. ACTUAL FIELD CONDITIONS MAY VARY FROM THE INDICATED CONTOURS.
3. LOCAL VARIATIONS FROM THE INDICATED CONTOURS SHOULD BE ANTICIPATED.
4. THIS DRAWING WAS PREPARED FROM A 50 SCALE PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON DATED NOVEMBER 1985 AND ENTITLED "TOPOGRAPHIC PLAN OF LAND IN BOSTON, MA, SOUTH BOSTON DISTRICT, DRAWING NO. 7.11L".
5. ELEVATIONS REFER TO BOSTON CITY BASE (BCB) WHEREIN EL. 0.00 (BCB) IS 5.65 FT. BELOW NATIONAL GEODETIC VERTICAL DATUM (NGVD).

0 125 250
SCALE IN FEET

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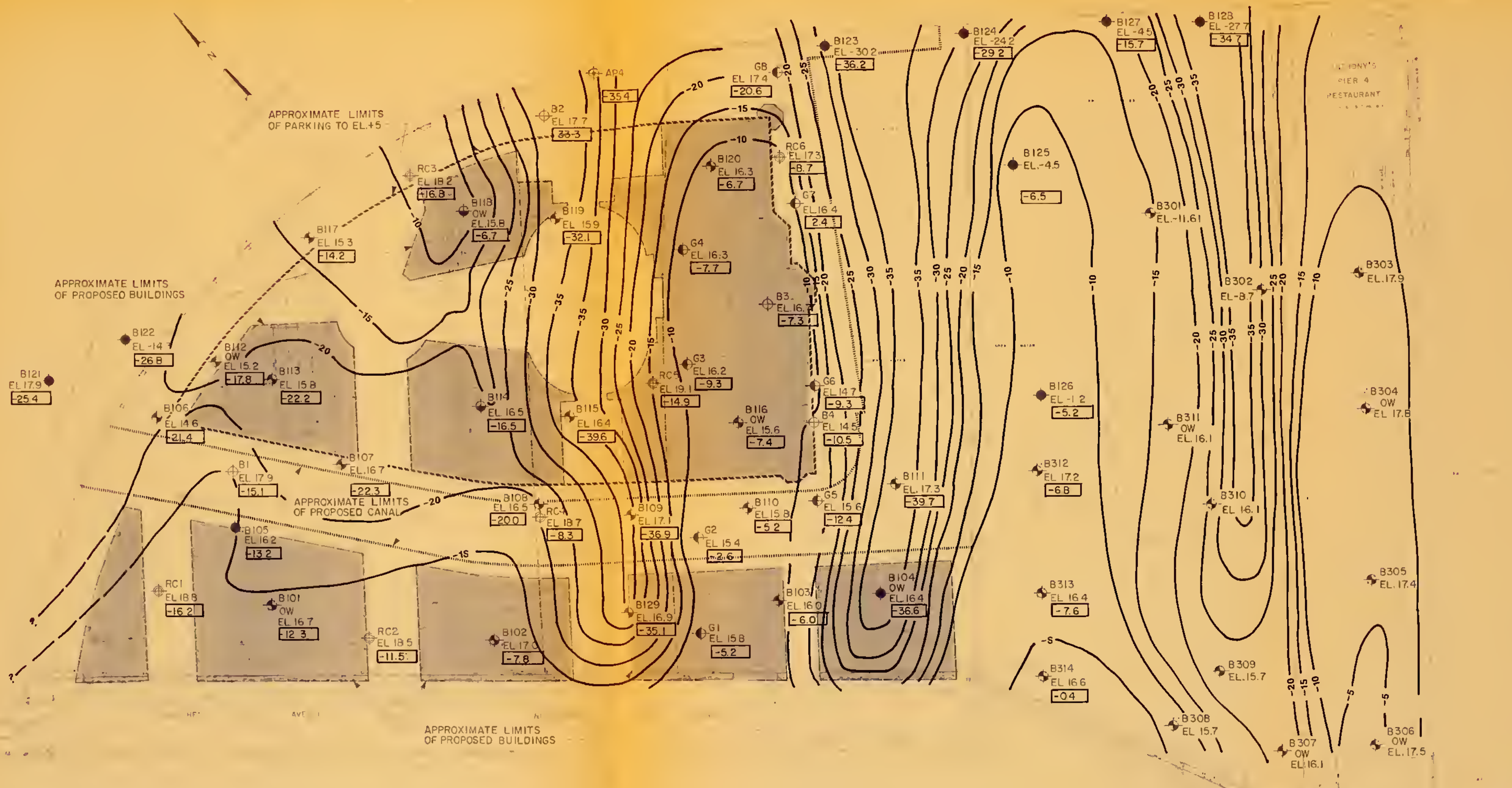
TOP OF GLACIAL TILL ELEVATION CONTOUR PLAN

SCALE: AS SHOWN
MARCH 1986

FIGURE 11

FILE NO. 5556



LEGEND:

—-20— ELEVATION CONTOUR OF TOP OF NATURAL INORGANIC SOIL.

NOTES:

1. WITH THE EXCEPTION OF AREAS OVER OPEN WATER, ELEVATION CONTOURS OF TOP OF NATURAL INORGANIC SOIL WERE GENERATED BY LINEAR INTERPOLATION BETWEEN SUBSURFACE EXPLORATIONS. IN OPEN WATER AREAS, SOUNDING DATA OBTAINED IN MARCH 1966 WAS USED IN CONJUNCTION WITH TEST BORING DATA TO GENERATE THE TOP OF NATURAL INORGANIC SOIL CONTOURS. SOUNDING DATA INCLUDED IN FIGURE 2 OF THE H&A REPORT ENTITLED, "PRELIMINARY SUBSURFACE INVESTIGATIONS AND FOUNDATION DESIGN STUDIES - PROPOSED WATERFRONT DEVELOPMENT ON NORTHERN AVENUE, FORT POINT CHANNEL TO ANTHONY'S PIER 4, BOSTON, MASSACHUSETTS", DATED 25 JANUARY 1971.

2. ELEVATION CONTOURS OF TOP OF NATURAL INORGANIC SOIL ARE BASED ON INTERPOLATION OF AVAILABLE DATA PROVIDED BY SUBSURFACE INVESTIGATIONS, AND ARE PRESENTED FOR THE PURPOSE OF INDICATING GENERAL TRENDS. ACTUAL FIELD CONDITIONS MAY VARY FROM THE INDICATED CONTOURS.

3. LOCAL VARIATIONS FROM THE INDICATED CONTOURS SHOULD BE ANTICIPATED.

4. THIS DRAWING WAS PREPARED FROM A 50 SCALE PLAN PREPARED BY SURVEY ENGINEERS OF BOSTON DATED NOVEMBER 1985 AND ENTITLED "TOPOGRAPHIC PLAN OF LAND IN BOSTON, MA, SOUTH BOSTON DISTRICT, DRAWING NO. 7,11L".

5. ELEVATIONS REFER TO BOSTON CITY BASE (BCB) WHEREIN EL. 0.00 (BCB) IS 5.65 FT. BELOW NATIONAL GEODETIC VERTICAL DATUM (NGVD).

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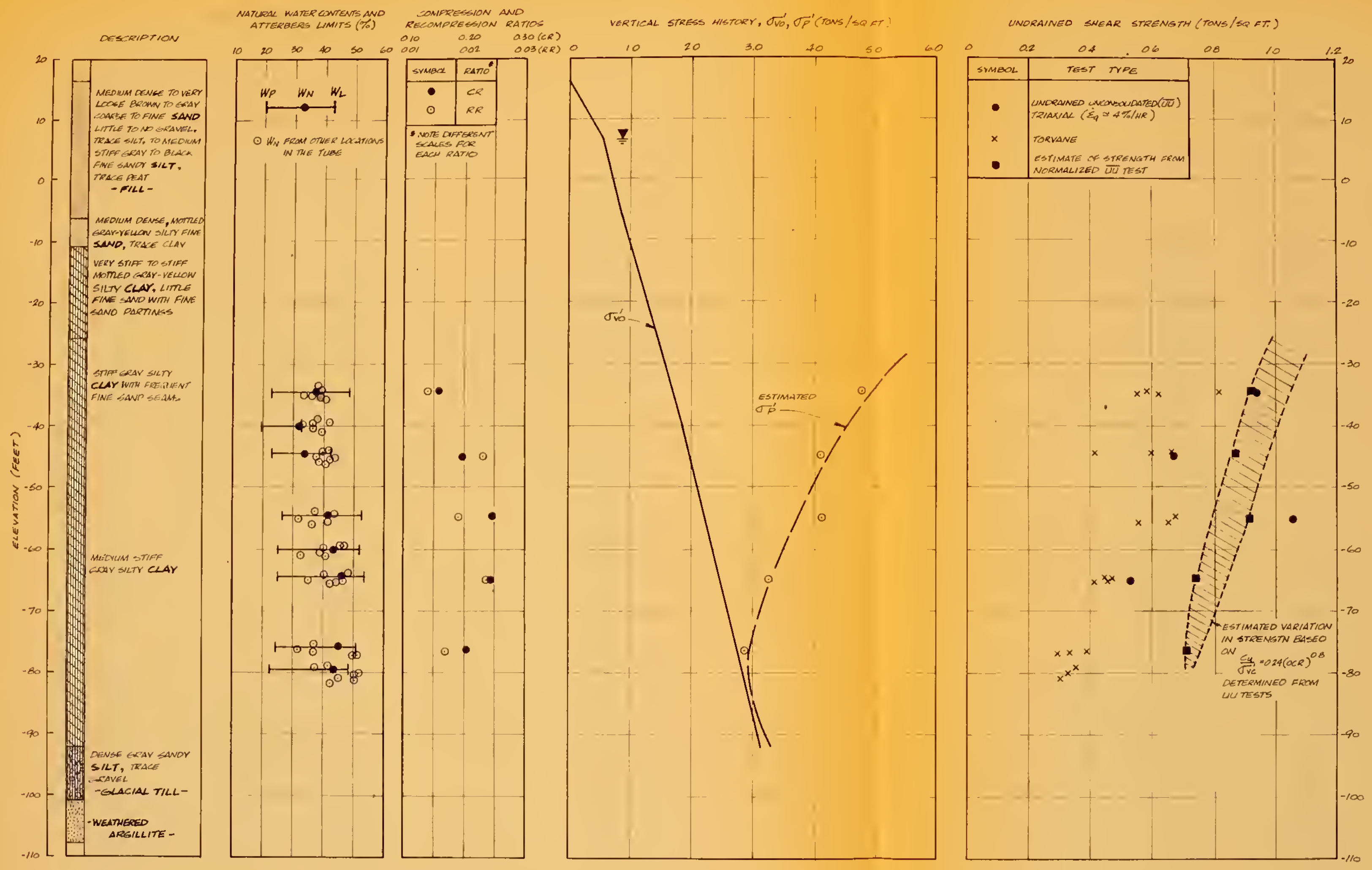
TOP OF NATURAL INORGANIC SOIL ELEVATION CONTOUR PLAN

SCALE: AS SHOWN
MARCH 1986

FIGURE 12

FILE NO. 5556



LEGEND.

w_L, w_P, w_N		LIQUID LIMIT, PLASTIC LIMIT AND NATURAL WATER CONTENT, RESPECTIVELY.
CR		COMPRESSION RATIO (= $\Delta\varepsilon / \Delta \log \sigma_v$)
RR	-	RECOMPRESSION RATIO (= $\Delta\varepsilon / \Delta \log \sigma_v$)
σ'_{vo}	-	EXISTING EFFECTIVE OVERBURDEN STRESS
σ'_p	=	PRECONSOLIDATION PRESSURE, AS DETERMINED FROM OEDOMETER TESTS USING CASAGRANDE'S CONSTRUCTION
$\overline{UU}$	=	UNCONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENTS SHEARED AT A STRAIN RATE EQUAL TO ABOUT 4%/HR.
TORVANE	:	INDEX STRENGTH TEST PERFORMED IN THE LABORATORY PRIOR TO EXTRUSION OF SOIL

NOTE: DATA ARE TABULATED IN APPENDIX E

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SUMMARY OF LABORATORY INDEX, COMPRESSIBILITY AND STRENGTH TESTS ON GRAY SILTY CLAY

SCALE: AS SHOWN
JANUARY 1986

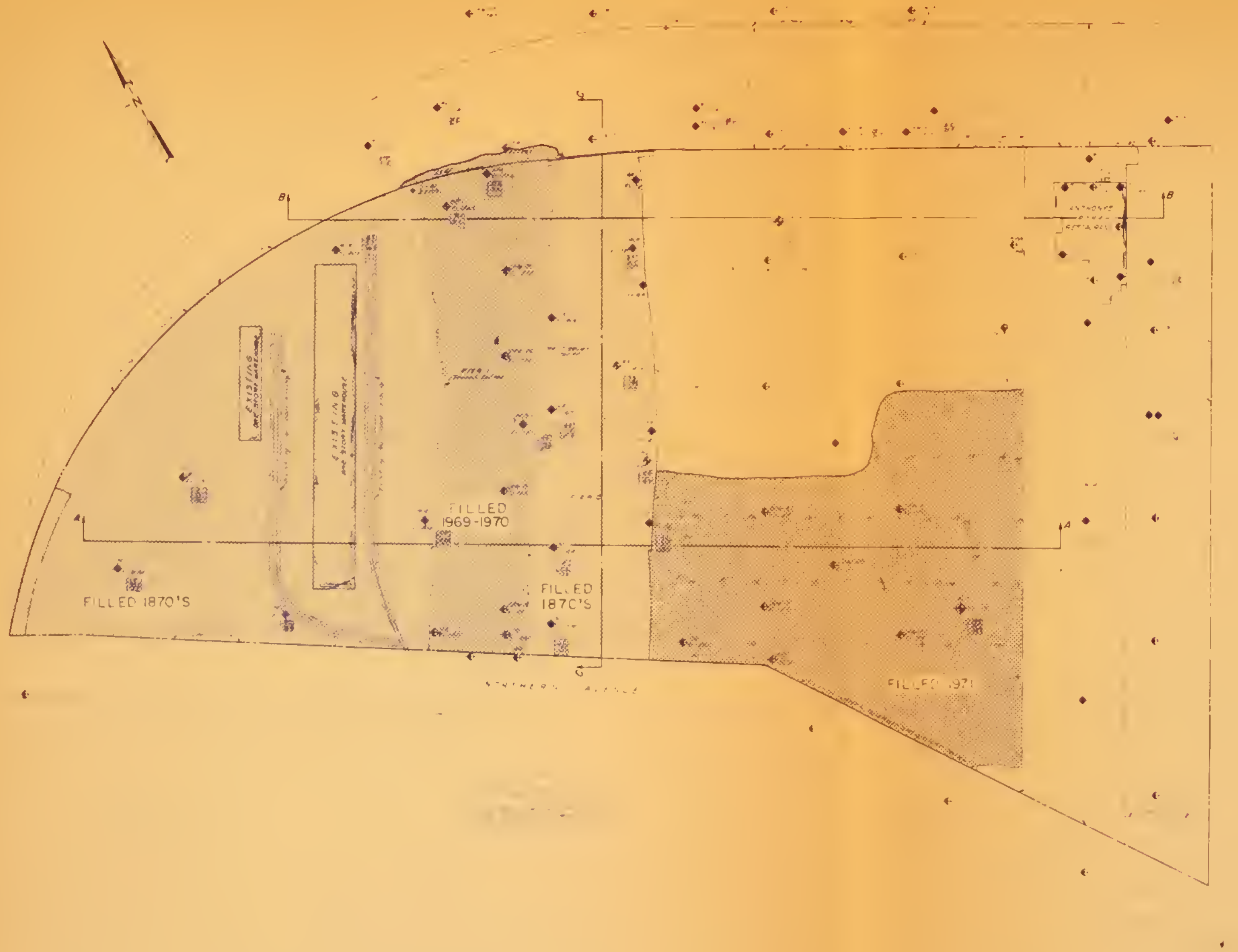
FIGURE 13

FILE NO. 5556

Appendix A

APPENDIX A

Logs of Previously Completed Test Borings



LEGEND

DPW-3

Refusal Boring

Shallow Boring

DPW 3 Location of test borings completed for the Mass. Department of Public Works in 1940

212 Location of test borings recorded in the Journal of the Boston Society of Civil Engineers, October 1951.

MPA-8 Location of test borings completed for the Port of Boston Authority during 1951.

2 Location of 2½ in. diameter standard test borings by C. L. Guild Const. Co. during November 1961

6 Location of 2½ in. diameter standard test borings to refusal by C. L. Guild Const. Co. during December 1964 in Appendix B

B 101 Location of 2½ in. diameter standard test borings completed by Atlantic Test Boring Co. during March 1968. Logs

Location of 3½ in. diameter test boring with undisturbed piston tube samples completed by Atlantic Test Boring Co. during March 1969. Log presented in Appendix D

A1 Location of 2½ in. diameter standard test borings completed by Raymond Concrete Pile Division during July-August 1970

RC-1 Location of test borings, in which NX rock cores of bedrock were obtained using Christensen barrel. Borings made by Raymond Concrete Pile Division during July-August 1970

RC-7 Location of test borings in which NX rock cores of bedrock were obtained using Christensen barrel. Borings made by Atlantic Test Boring Co. during July 1970

A = Top Elevation of Natural Inorganic Soil
B = Top Elevation of Till
C = Top Elevation of Bedrock

PLAN PREPARED FROM DATA
PRESENTED IN 1971 HBA REPORT

HALEY & ALDRICH, INC.
CAMBRIDGE MASSACHUSETTS
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

PIERS 1-2-3
MASTER PLAN DEVELOPMENT
BOSTON, MASSACHUSETTS

SUBSURFACE EXPLORATION PLAN

SCALE: 1"=200'
OCTOBER 1984

FIGURE A-1

FILE NO. 5556 B3

ATLANTIC TEST BORING CO.

BOSTON

To HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS
238 MAIN STREET - CAMBRIDGE, MASSACHUSETTS

Date AUGUST 20, 1970 Job No.

Location of Borings ANTHONY PIER 4 - NORTHERN AVENUE - BOSTON, MASSACHUSETTS

ll borings are plotted to a scale of 1" = 5 ft. using B. C. B. as a fixed datum.

No. No. No. No.

GENERAL NOTES:

1. CASING O.D. = 2.5"
2. SAMPLER I.D. = 1.375" (O.D. = 2")
3. HAMMER WEIGHT = 140 LBS.
4. HAMMER FALL = 30"

} SAMPLER HAMMER

5. HAMMER WEIGHT = 350 LBS.
6. HAMMER FALL = 24"

} CASING HAMMER

7. REFUSAL IS DEFINED AS THAT POINT AT WHICH 100 OR MORE BLOWS OF A 140 LB. HAMMER FALLING 30" PRODUCES PENETRATION OF LESS THAN ONE- INCH.
8. WE DO RECOMMEND TEST PITS TO DETERMINE THE REFUSAL WHERE REFUSALS ARE SHALLOW, TO DETERMINE IF LEDGE OR BOULDER IS ENCOUNTERED. WE ARE EQUIPED FOR TEST PITS.
9. GROUND SURFACE ELEVATIONS: B. C. B.
10. DENSITY OR COMPACTION OF SAND:

BLOWS PER FOOT ON SPOON	DENSITY
0 - 4	VERY LOOSE
4 - 10	LOOSE
10 - 30	MEDIUM COMPACT
30 - 50	COMPACT
50+	VERY COMPACT

11. CONSISTENCY OF CLAYS:

BLOWS PER FOOT ON SPOON	CONSISTENCY
0 - 2	VERY SOFT
2 - 4	SOFT
4 - 8	MEDIUM STIFF
8 - 15	STIFF
15 - 30	VERY STIFF
30+	HARD

Used ' of " Casing Used ' of " Casing Used ' of " Casing Used ' of " Casing

Total Footage 235.0'
Foreman P. J. MALONEY, JR.
Classification by P. J. MALONEY
Sheet 1 of 1

Figures in right hand column indicate number of blows required to drive sampling pipe one foot, using 140-lb. weight falling 30 inches.

ATLANTIC TEST BORING CO. INC.
34 KING STREET
BOSTON MASS 02122

To HALEY & ALDRICH, INC. CONSULTING SOIL ENGINEERS
238 MAIN STREET
CAMBRIDGE, MASSACHUSETTS
Date AUGUST 20, 1970 Job No
Location of Borings ANTHONY PIER 4 - NORTHERN AVENUE - BOSTON, MASSACHUSETTS

DEPTH
All borings are plotted to a scale of 1" = 5 ft. using B. C. B. as a fixed datum
ELEVATION

No BORING BC-7

GROUND SURFACE EL. -11.5'

Elevation	Description	Blows
-11.5'	PUSHED BLACK SILT, ORGANIC ODOR, WET	PUSHED
5.0'	VERY LOOSE BLACK SILTY SAND, ORGANIC ODOR, WET	1 2 3 2 2 3
-25.5'	MEDIUM STIFF BLUE CLAY, DAMP	3 3 3 2 3 4 3 3 3
-40.5'	MEDIUM STIFF BLUE CLAY, WITH LAYERS OF FINE SAND, DAMP	3 3 3 3 4 4 3 4 4
7.5'		

Used ' of " Casing

No BORING BC-7 ADVANCED

Elevation	Description	Blows
	MEDIUM STIFF BLUE CLAY, DAMP	3 3 4 3 3 3 2 3 3 2 3 3 3 3 3 2 3 3
-122.5'	VERY COMPACT GRAY FINE SAND, SOME FINE TO COARSE GRAVEL, AND SILT, TILL, DAMP	50/3" 50 10
-135.5'		

Used ' of " Casing

No BORING BC-7 ADVANCED

Elevation	Description	Blows
	ARGILLITE SOFT ROCK, DIAMOND DRILLED, NO RECOVERY	
-148.5' -148.8'		

BORING STOPPED BY
JOHN HUMPHREY

TIDE WATER

DATE: JULY 23, 1970

* USED 350LB. WEIGHT WITH 2" SPLIT SPOON ABOVE 3" REFUSAL RECOVERED 3" OF ARGILLITE ROCK

Used 148.8' of 2½" Casing

Figures in right hand column indicate number of blows required to drive sampling pipe one foot, using 140-lb. weight falling 30 inches.

Total Footage +137.3'
Foreman P. J. MALONEY, JR.
Classification by P. J. M.
Sheet 1 of 2

To CAMBRIDGE, MASSACHUSETTS Date AUGUST 20, 19 70 Job No

Location of Borings ANTHONY PIER 4 - NORTHERN AVENUE - BOSTON, MASSACHUSETTS

DEPTH

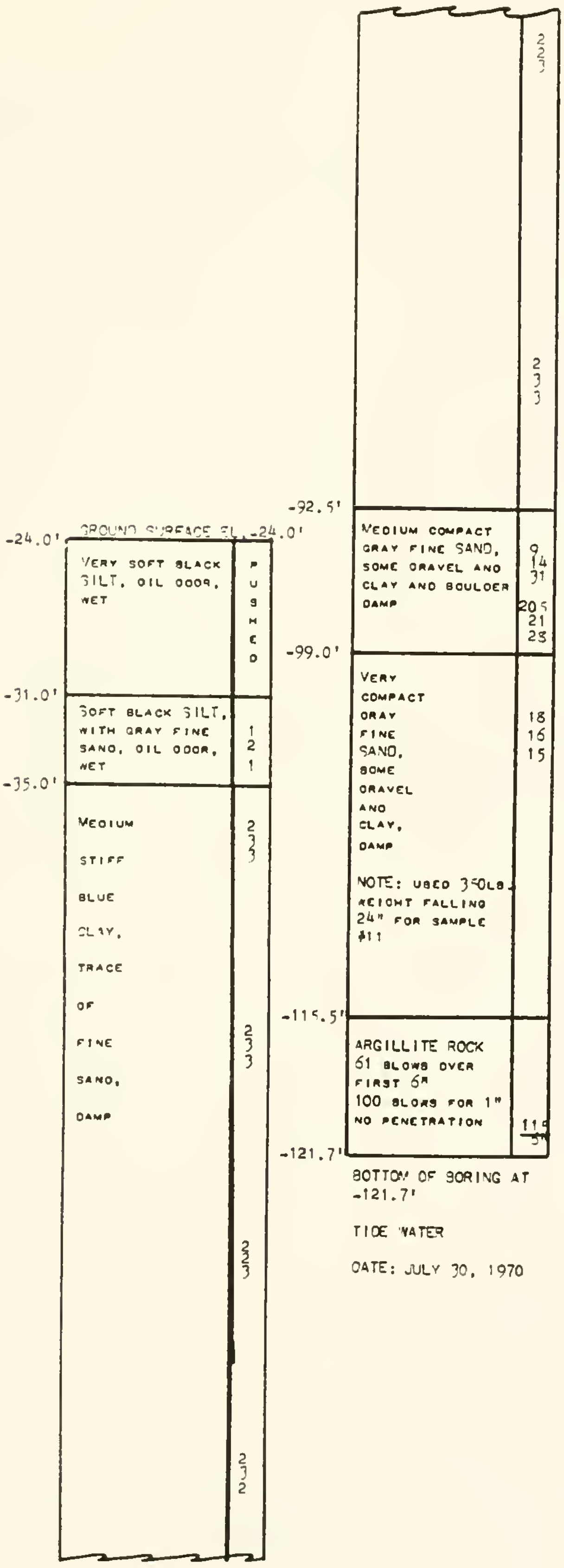
All borings are plotted to a scale of 1" = 5 ft using B. C. B. as a fixed datum.

ELEVATION

No BORING PC-6

No BORING PC-6 ADVANCED

No BORING PC-6 ADVANCED


-24.0'
GROUND SURFACE EL. -24.0'
VERY SOFT BLACK SILT, OIL ODOR, WET
PUSHED
-31.0'
SOFT BLACK SILT, WITH GRAY FINE SAND, OIL ODOR, WET
1
2
1
-35.0'
MEDIUM STIFF BLUE CLAY, TRACE OF FINE SAND, DAMP
2
3
3
2
3
3
2
2
3
2
3
2
2
2
3
2
3
3
-92.5'
MEDIUM COMPACT GRAY FINE SAND, SOME GRAVEL AND CLAY AND BOULDER DAMP
9
14
31
205
21
23
-99.0'
VERY COMPACT GRAY FINE SAND, SOME GRAVEL AND CLAY, DAMP
18
16
15
NOTE: USED 350LB. WEIGHT FALLING 24" FOR SAMPLE #11
-115.5'
ARGILLITE ROCK
61 BLOWS OVER FIRST 6"
100 BLOWS FOR 1"
NO PENETRATION
115
5"
-121.7'

BOTTOM OF BORING AT -121.7'

TIDE WATER

DATE: JULY 30, 1970

Used ' of " Casing

Used 121.7' 2½" Casing

Used of Casing

Figures in right hand column indicate number of blows required to drive sampling pipe one foot, using 140-lb. weight falling 30 inches.

Total Footage 97.7'

Foreman F. J. MALONEY, JR.

Classification by F. J. M.

Sheet 2 of 2

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION

RAYMOND INTERNATIONAL INC

NEW YORK NEW YORK

To HALEY & ALDRICH INC. Date AUGUST 24, 19 70

Address 233 MAIN STREET CAMBRIDGE, MASS. 02142

WE HAVE COMPLETED THE FOLLOWING BORINGS FOR YOU AT PIER 4 AREA BOSTON, MASSACHUSETTS

WITH RESULTS SHOWN BELOW IN ACCORDANCE WITH YOUR INSTRUCTIONS, WE HAVE SENT LABELLED SAMPLES OF THE STRATA ENCOUNTERED

TO CLIENT ADDRESS CAMBRIDGE, MASS.

VIA U.P.S. DURING JOB UNDER DATE OF RAYMOND CONCRETE PILE DIVISION RAYMOND INTERNATIONAL INC. LOCATION PLAN SCALE 1 -

BORINGS LOCATED BY THE CLIENT

NO PLAN AVAILABLE, ONE HAS BEEN

REQUESTED.

Compass Points

This boring report prepared in the

BOSTON OFFICE of the

Raymond Concrete Pile Division

RAYMOND INTERNATIONAL INC.

By G. LARABA

Job No. ZE-17237-BOS

Sheet 1 of 15

F 344-3 50 PARS

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION

RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC, Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. B-1

GROUND SURFACE ELEVATION 17.91'

20'

5'

10'

5'

0'

-5'

-10'

			0'
33 42 39 41 23	HARD TO VERY HARD SAND GRAVEL ~~CINDERS~~	12-15 25-31	4' 6"
16 14 10	LOOSE SAND GRVL CINDERS	4-5 4-6	8'
12 10 9 10 12	NOTE A.	1-1 1-1	13'
18 14 10 11 14 13 14 9 13 15 16	SOFT GRAY SILT LITTLE CLAY LITTLE FINE SAND TRACE OF BLACK ORGANICS	2-2 2-2 2-2 3-2	24'
12 18 18 23 24 25 23 26 28	VERY SOFT ORGANIC SILT TRACE SHELLS	1-1 2-1 1-2 1-1	33'
38 46 52 35 33 28 28 42 40	HARD TO FIRM GRAY FINE SAND LITTLE SILT TR. CLAY TR. BLACK ORGANIC SEAMS	9-18 15-21 8-13 15-13	42'
37 31 26 26 25 28 29 26	VERY SOFT TO MED. GRAY CLAY W/FINE SAND & SILT LAYERS.	PUSH 4-3	50'

Boring No. B-1 CONT.

		50'
MEDIUM GRAY CLAY	2-3 3-4 1-2 2-3 2-2 3-2	77'
VERY SOFT GRAY CLAY	PUSH PUSH PUSH PUSH PUSH PUSH	106' 6"

Boring No. B-1 CONT.

		106'
VERY HARD GRAY MED. TO FINE GRAVEL SOME CLAY TR. MED. TO FINE SAND	13-53 77-83 30-43 61-84	113'
VERY HARD GRAY SILT TRACE CLAY TRACE COARSE TO FINE SAND	7-3 13-16	124'
VERY HARD GRAY SILT TRACE MED. TO FINE GRAVEL TRACE COARSE TO FINE SAND TRACE OF CLAY	13-10 14-15 23-18 31-33	140'
~~WEATHERED SHALE~~	35/3	140'

Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman G. PULSIFER

Classifications by FOREMAN

Job No. EB-17837-BOS

Sheet 2 of 15

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. B-1 CONT.

USED 38' OF 2 1/2'' CASING.

WATER LEVEL NOT NOTED

PUSH - INDICATED THE SPLIT SPOON SAMPLER WAS ADVANCED BY THE WEIGHT OF THE RODS ONLY.

REFUSAL AT 140'3'' 150 BLOWS NO PENETRATION.

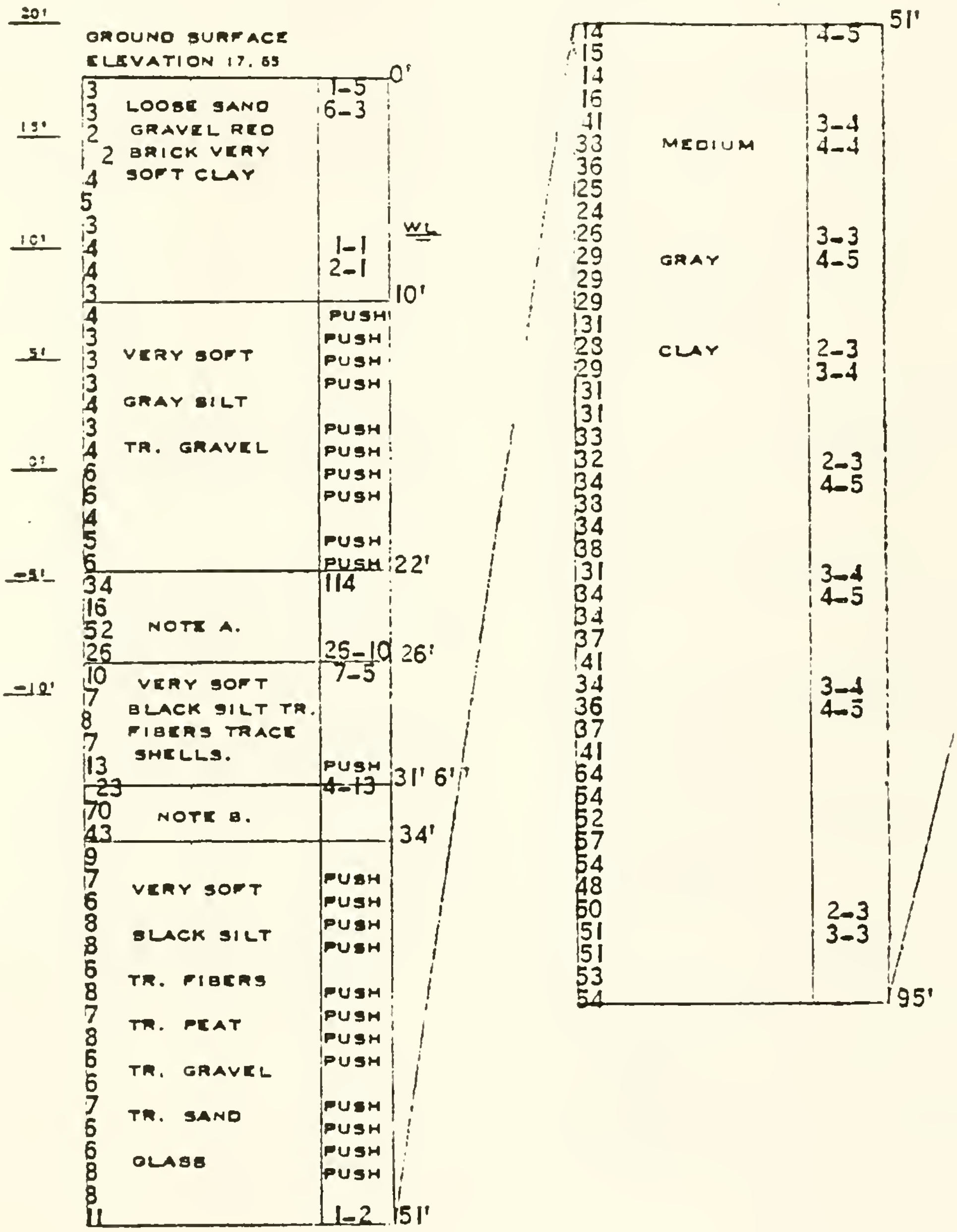
NOTE. SAMPLES FROM 124' TO 126' FROM 129' TO 131' AND FROM 140' TO 140'3'' USED OPEN END A-ROD AND 350 LB. WEIGHT.

NOTE A. VERY SOFT GRAY SILT LITTLE CLAY LITTLE FINE SAND TR. BLACK ORGANICS.

7-24-70

Boring No. B-2

Boring No. B-2 CONT.



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Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage
Foreman G. PULSIFER
Classifications by FOREMAN
Job No. EB-17837-BOS
Sheet# 3 of 15

F 384-3 50 PADS

TEST BORING REPORT
RAYMOND
CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. B-2 CONT.

95'	52 54 57 57 58	VERY SOFT TO MEDIUM BLUE CLAY	PUSH PUSH-2
109'		VERY HARD BLUE CLAY LITTLE MED. TO FINE GRAVEL TRACE OF FINE SAND	25-40 71-81
115'		VERY HARD GRAY FINE SAND & SILT TR. MED. TO FINE GRVL. TR. CLAY	16-23 36-77
119'		NOTE C.	56-55
120' 6"		~~SHALE WAFERS~~	~~71-115~~
121'			

Boring No. B-2 CONT.

NOTE C. VERY HARD MED. TO FINE GRAVEL SOME FINE SAND TRACE SILT TRACE OF CLAY ROCK FRAGMENTS.

USED 100' OF 2 1/2" CASING.

WATER LEVEL NOTED AT 7' BELOW SURFACE 3 HRS. AFTER COMPLETION. WITH 12' OF CASING STILL IN PLACE.

PUSH - INDICATES THE SPLIT SPOON SAMPLER WAS ADVANCED BY THE WEIGHT OF THE RODS ONLY.

NOTE A. HARD GRAY COARSE TO FINE SAND TR. FINE GRAVEL TR. SILT BOULDER

6-29-70

NOTE B. FIRM TO VERY HARD GRAY FINE SAND LITTLE SILT BOULDER

Boring No. B-3

GROUND SURFACE ELEVATION 18.74'

20' 15'	7 5 6 3	NOTE A.	13-12 5-5	0'
10' 5'	2 2 2 4 3 4 4 5 7 7 6	SOFT GRAY SILT LITTLE FINE SAND TRACE BLACK SILT	6-5 3-2 2-2 1-2	4' WL
0' -5'	7 8 7 6 6 8 10 12 11	MEDIUM TO STIFF GRAY SILT LITTLE FINE SAND	3-6 6-4 3-4 4-4	15'
-10'	14 18 26 32 25 14	HARD BROWN FINE SAND LITTLE SILT TRACE OF CLAY LAYERED	7-10 15-17 7-7	24'
		STIFF GRAY CLAY LITTLE FINE SAND TR. SILT THICK LAYERED	6-6	31'
		NOTE B.	2-4 4-6	35'
		FIRM GRAY FINE SAND LITTLE SILT LITTLE CLAY LAYERED	7-12 12-9	39'
		MEDIUM GRAY CLAY VERY THIN LAYERS FINE SAND	2-3 4-4	43'
				50'

Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman G. PULSIFER

Classifications by FOREMAN

Job No. EB-13201-BOS

Sheet 4 of 15

F 344-3 50 PADS

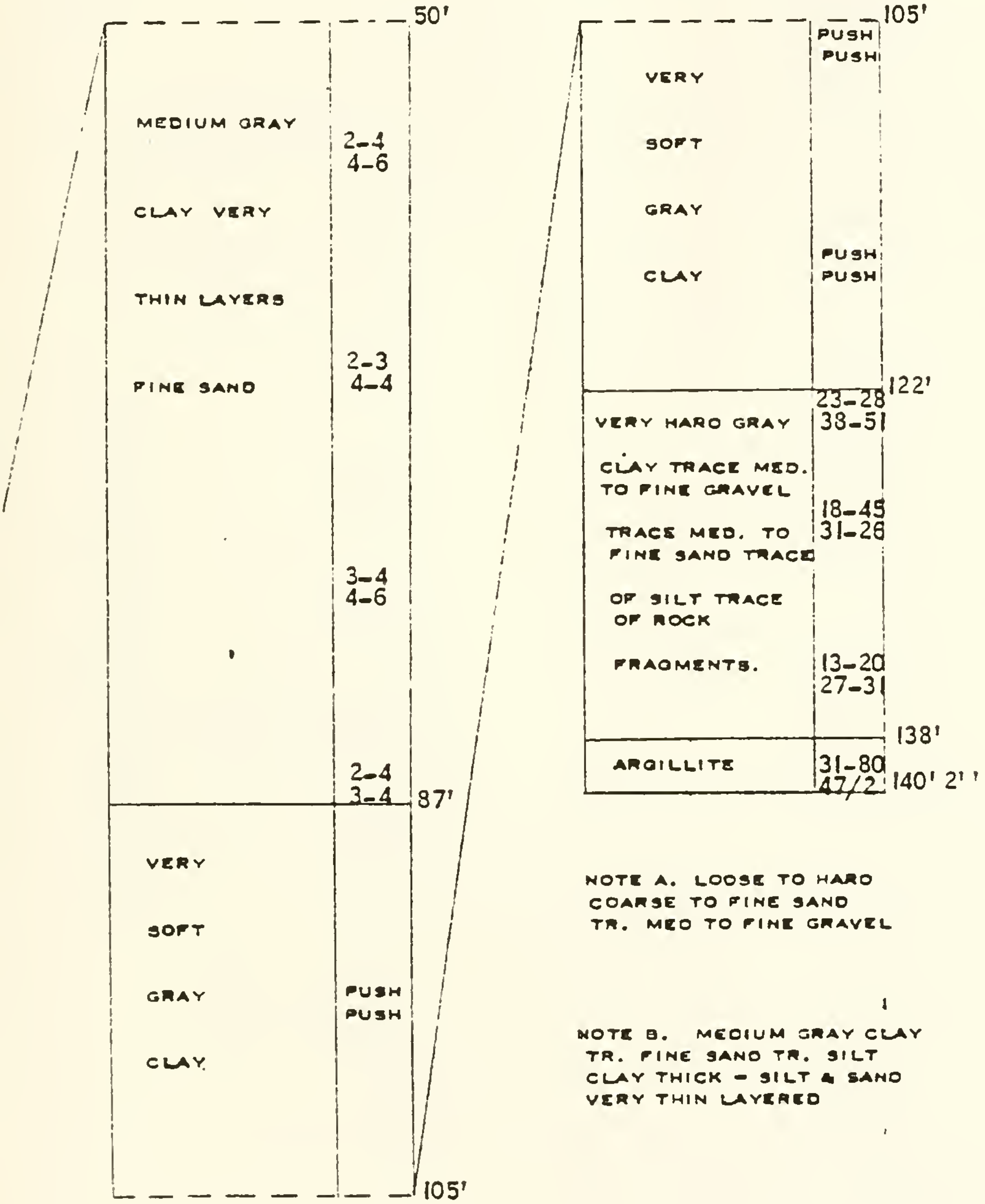
TEST BORING REPORT
RAYMOND
CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. B-3 CONT. Boring No. B-3 CONT. Boring No. B-3 CONT.



NOTE A. LOOSE TO HARD
COARSE TO FINE SAND
TR. MED TO FINE GRAVEL

NOTE B. MEDIUM GRAY CLAY
TR. FINE SAND TR. SILT
CLAY THICK - SILT & SAND
VERY THIN LAYERED

PUSH - INDICATES THE SPLIT SPOON SAMPLER WAS ADVANCED BY THE WT. OF THE RODS ONLY.

USED 30' OF 2 1/2'' CASING.

WATER LEVEL NOTED AT 12'6'' BELOW SURFACE 1/2 HOUR AFTER COMPLETION W/15' OF CASING STILL IN PLACE.

REFUSAL AT 140'2'' 120 BLOWS WITH NO PENETRATION.

NOTE. FROM 138' TO 139' WASHED & CHOPPED & FROM 139' TO 140'2'' USED 350 LB. WEIGHT AND OPEN END A-ROD

7-13-70

Classifications are made from visual inspection.
Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.
Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage
Foreman G. PULSIFER
Classifications by FOREMAN
Job No. EB-17337-BOS
Sheet 5 of 15

F 344-3 50 PADS

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION

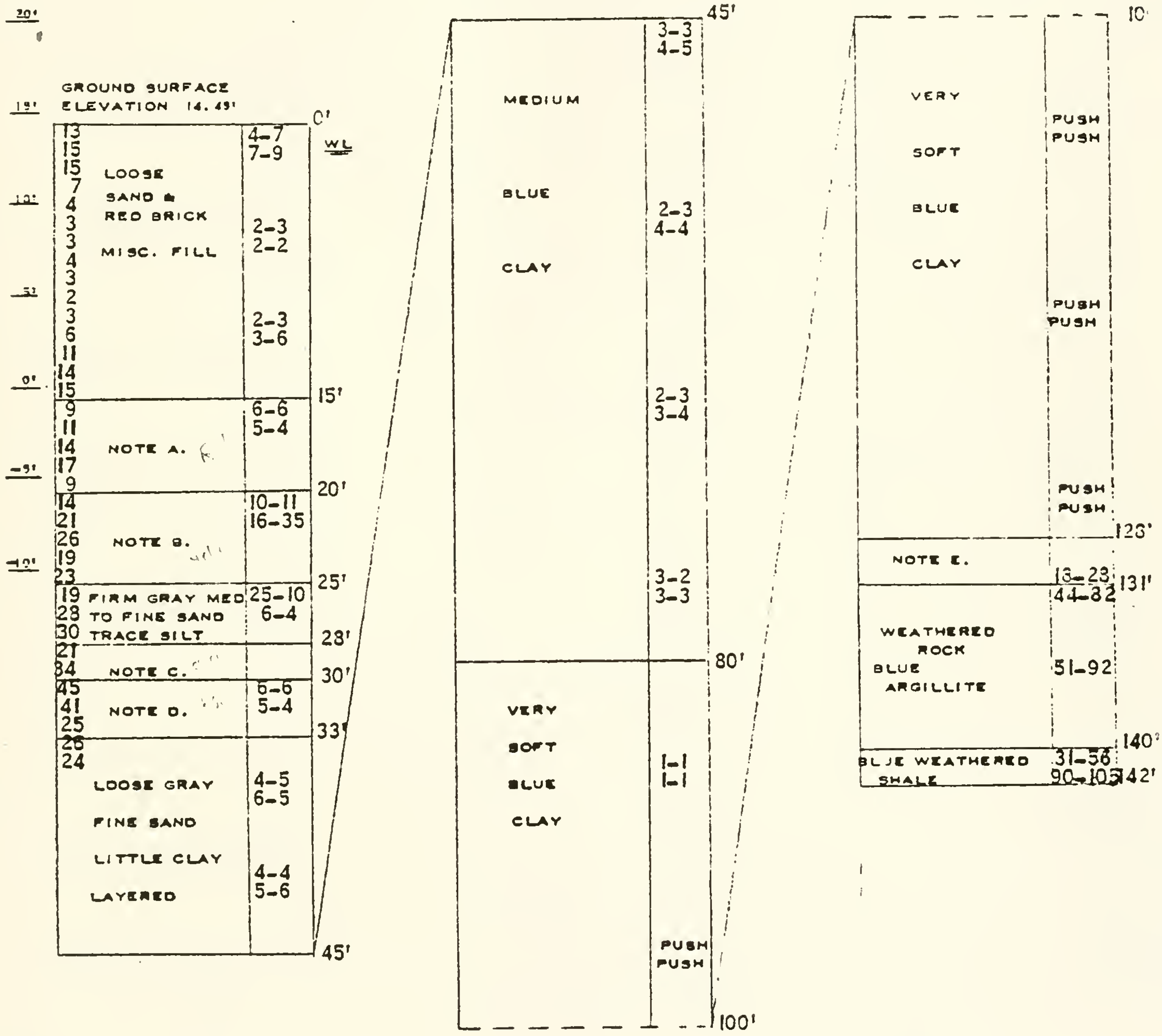
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. B-4 Boring No. B-4 CONT. Boring No. B-4 CONT.



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Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman G. PULSIFER

Classifications by FOREMAN

Job No. EB-17837-BOS

Sheet 6 of 15

7 344-3 50 PADS

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION

RAYMOND INTERNATIONAL, INC.

To HALEY & ALDRICH INC. Date AUGUST 24 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. B-4 CONT. Boring No. R C I Boring No. R C I CONT.

NOTE A. LOOSE COARSE TO FINE SAND & MEDIUM TO FINE GRAVEL TRACE SILT

NOTE B. HARD GRAY COARSE TO FINE SAND LITTLE MED. TO FINE GRAVEL TR. SILT BOULDERS.

NOTE C. STIFF YELLOW CLAY LAYER WOOD NEAR END OF CASING. (WASHED & CHOPPED)

NOTE D. STIFF GRAY SILT LITTLE FINE SAND PIECES OF CHOPPED WOOD

NOTE E. VERY HARD CLAY TR. MED. TO FINE SAND LITTLE MEDIUM TO FINE GRAVEL.

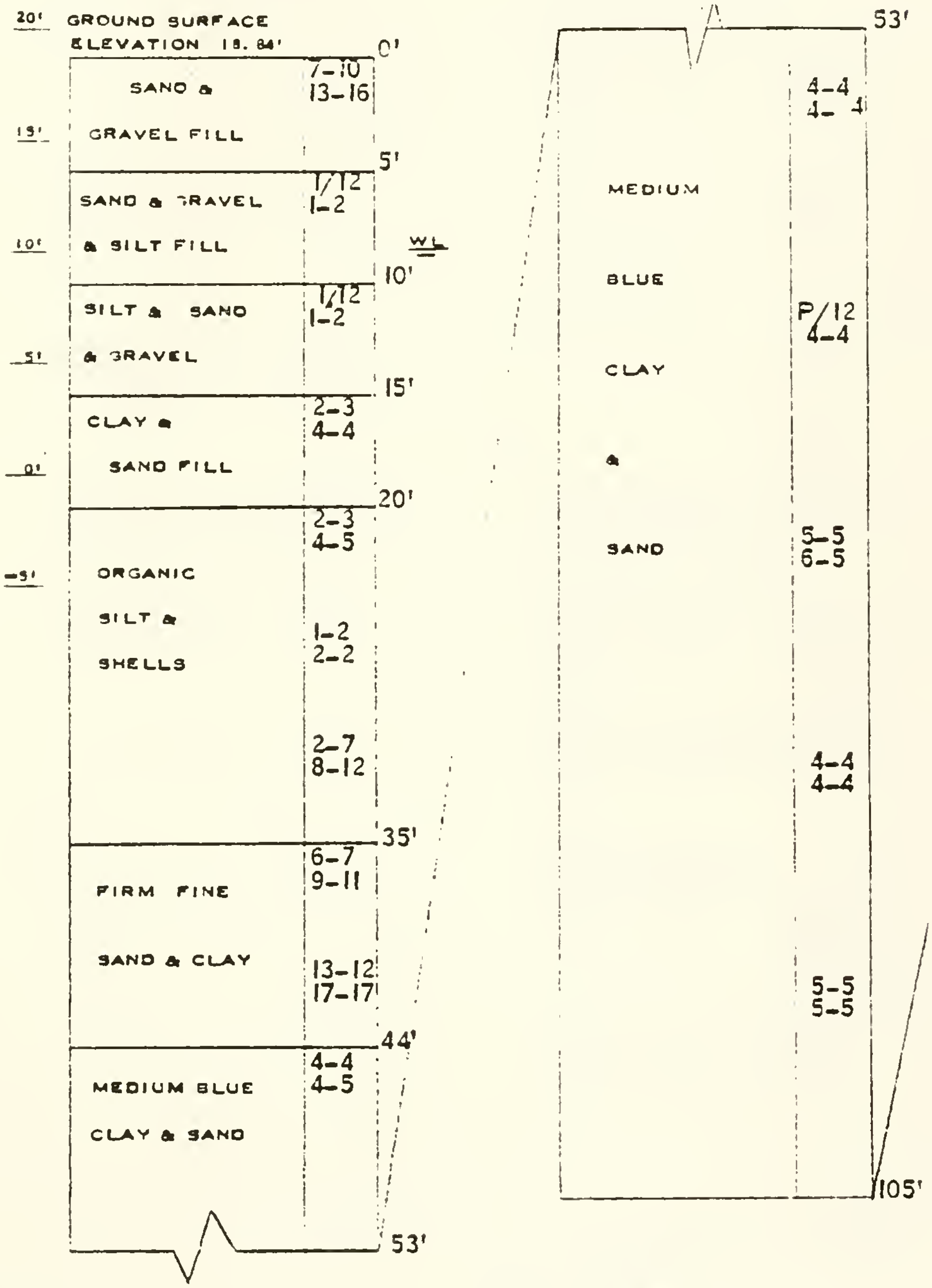
USED 35' OF 2 1/2'' CASING.

WATER LEVEL NOTED AT 18'' BELOW SURFACE ON COMPLETION

PUSH – INDICATES THE SPLIT SPOON SAMPLER WAS ADVANCED BY THE WT. OF THE RODS ONLY.

NOTE. FROM 140' TO 142' USED 350 LB. WT. AND OPEN END A-RODS.

JULY 17, 1970



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Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman G. PULSIFER

Classifications by FOREMAN

Job No. EB-17837-BOS

Sheet 7 of 15

F 344-3 50 PADS

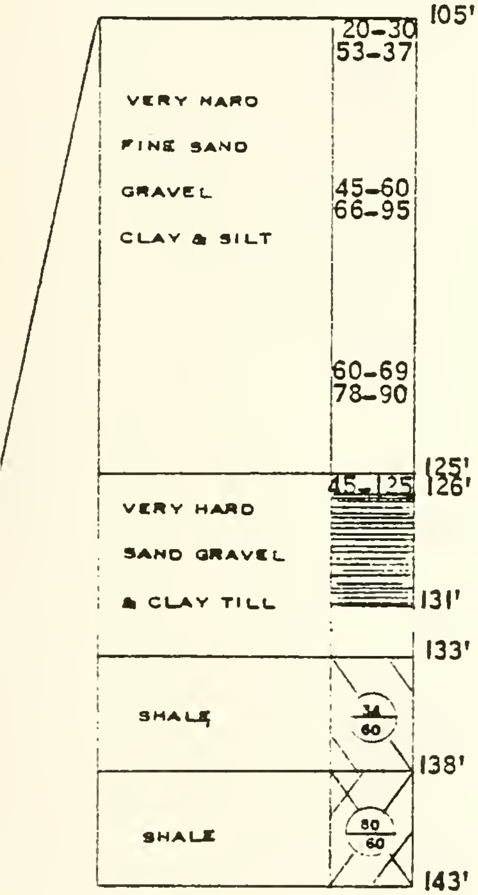
TEST BORING REPORT
RAYMOND
CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. R C I CONT.



Boring No. R C I CONT.

USED 15' OF 4" CASING

USED 125' OF NX FLUSH JOINT CASING.

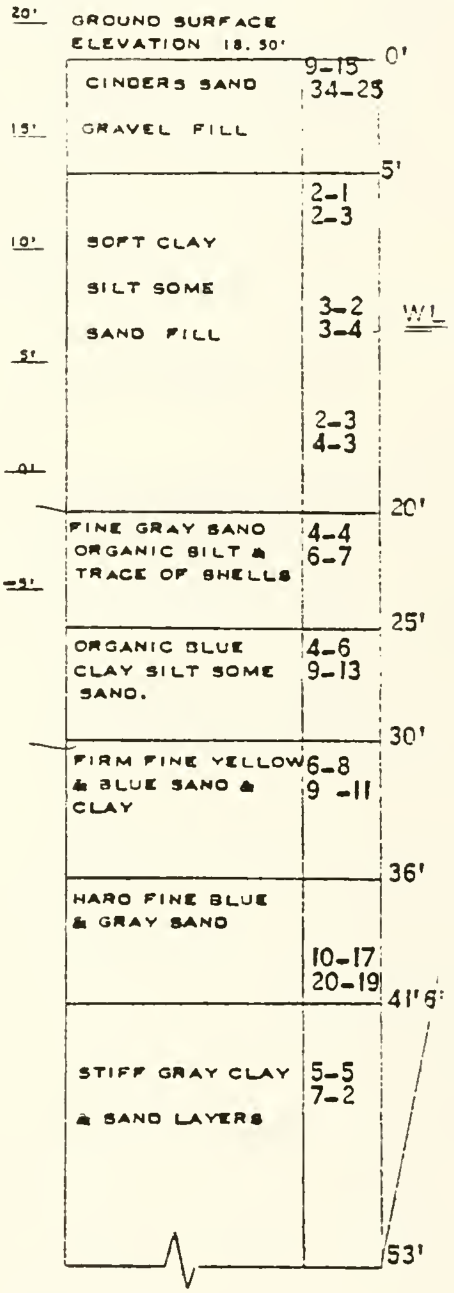
NOTE. FROM 126' TO 131' DRILLED WITH DIAMOND BIT THROUGH TILL 36" RECOVERY.

P – INDICATES THE SPLIT SPOON SAMPLE WAS ADVANCED BY THE WT. ONLY.

WATER LEVEL NOTED AT 8' TO 9' BELOW SURFACE AND AS TIDAL.

8–14–70

Boring No. R C 2



Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe using a 140 lb. weight falling 30 inches.

6 INCHES

Total Footage

Foreman B. RONAN

Classifications by FOREMAN

Job No. EB17837-BOS

Sheet 8 of 15

F 544-3 50 PADS

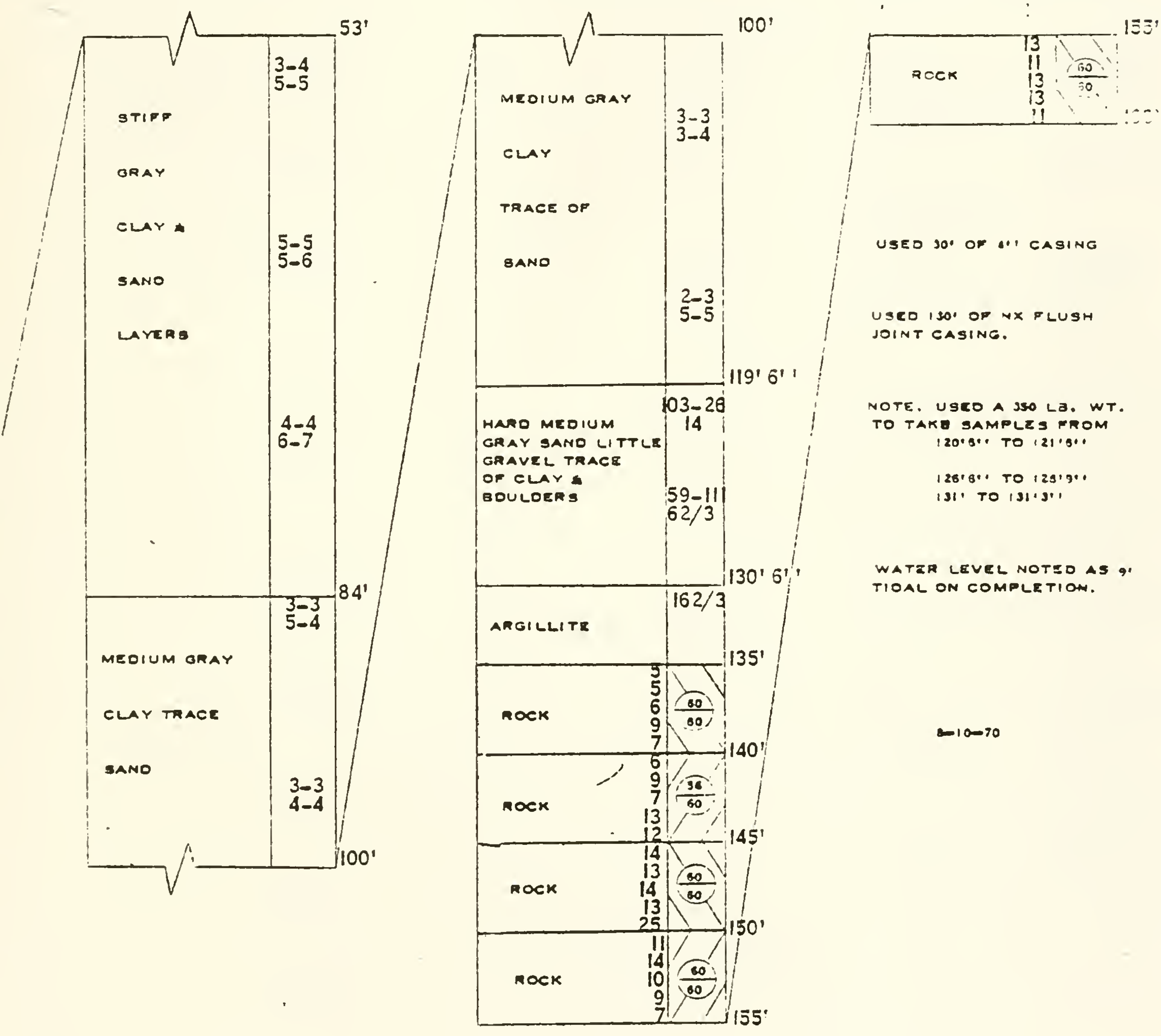
TEST BORING REPORT
RAYMOND
CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. R C 2 CONT. Boring No. R C 2 CONT. Boring No. R C 2 CONT.



USED 30' OF 4'' CASING

USED 130' OF NX FLUSH JOINT CASING.

NOTE. USED A 350 LB. WT. TO TAKE SAMPLES FROM
120'6'' TO 121'6''
126'6'' TO 128'9''
131' TO 131'3''

WATER LEVEL NOTED AS 9' TIDAL ON COMPLETION.

8-10-70

Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage
Foreman L. CREIGHTON
Classifications by FOREMAN
Job No. EB-17837-BOS
Sheet 9 of 15

F 344-3 5C [illegible]

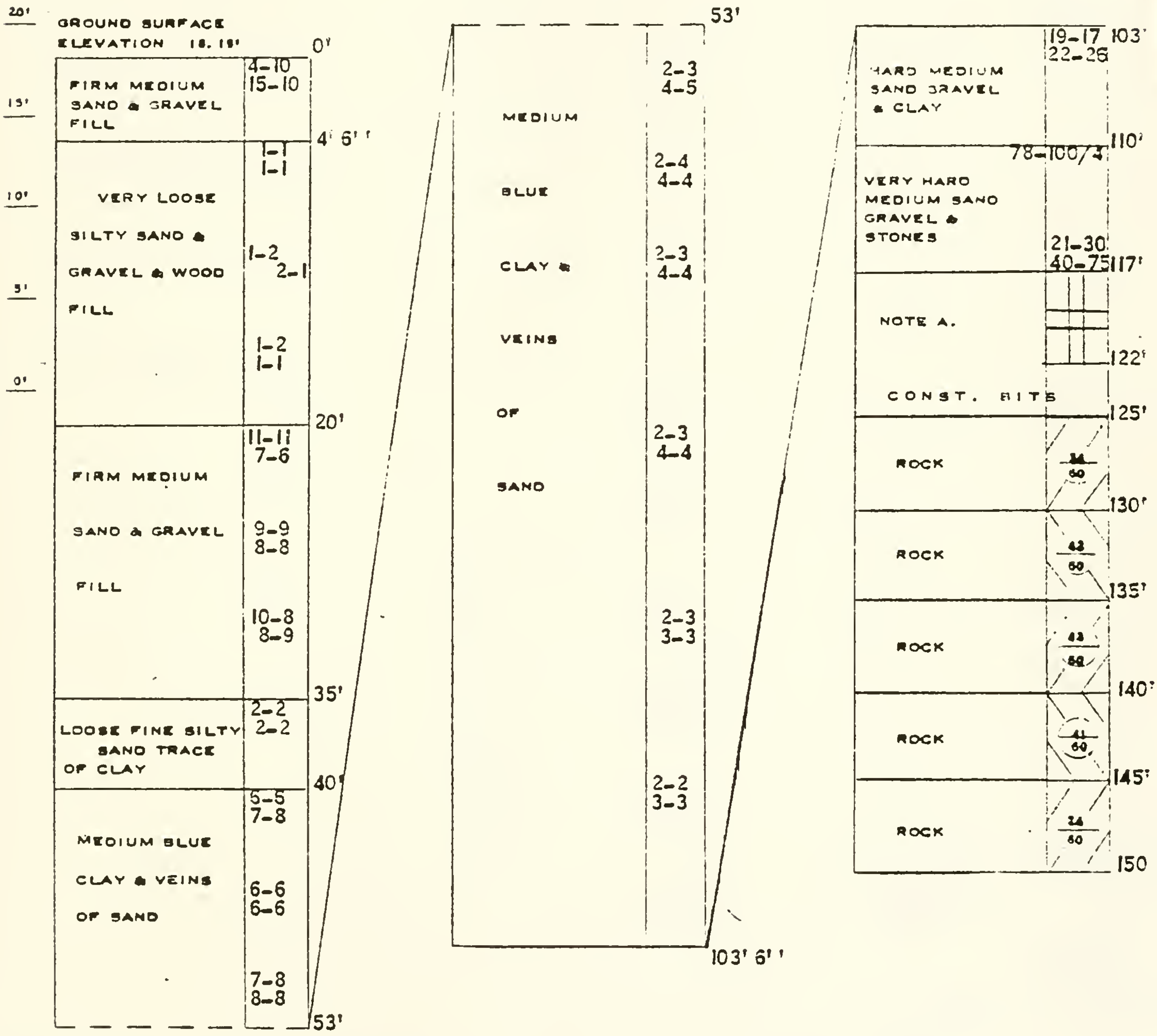
TEST BORING REPORT
RAYMOND
CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. R C 3 Boring No. R C 3 CONT. Boring No. R C 3 CONT.



20'
15'
10'
5'
0'
GROUND SURFACE ELEVATION 18.19'
0'
FIRM MEDIUM SAND & GRAVEL FILL
4-10
15-10
4' 6''
VERY LOOSE SILTY SAND & GRAVEL & WOOD FILL
1-1
1-1
1-2
2-1
1-2
1-1
20'
FIRM MEDIUM SAND & GRAVEL FILL
11-11
7-6
9-9
8-8
10-8
8-9
35'
LOOSE FINE SILTY SAND TRACE OF CLAY
2-2
2-2
40'
MEDIUM BLUE CLAY & VEINS OF SAND
5-5
7-8
6-6
6-6
7-8
8-8
53'
53'
MEDIUM BLUE CLAY & VEINS OF SAND
2-3
4-5
2-4
4-4
2-3
4-4
2-3
4-4
2-3
3-3
2-2
3-3
103' 6''
HARD MEDIUM SAND GRAVEL & CLAY
19-17
22-26
103'
110'
VERY HARD MEDIUM SAND GRAVEL & STONES
78-100/3
21-30
40-75
117'
NOTE A.
122'
CONST. BITS
125'
ROCK
34/60
130'
ROCK
42/60
135'
ROCK
43/60
140'
ROCK
41/60
145'
ROCK
24/60
150

Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman L. CREIGHTON

Classifications by FOREMAN

Job No. 23-17837-BOS

Sheet 10 of 15

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1″ = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. R C 3 CONT. Boring No. R C 4 Boring No. R C 4 CONT.

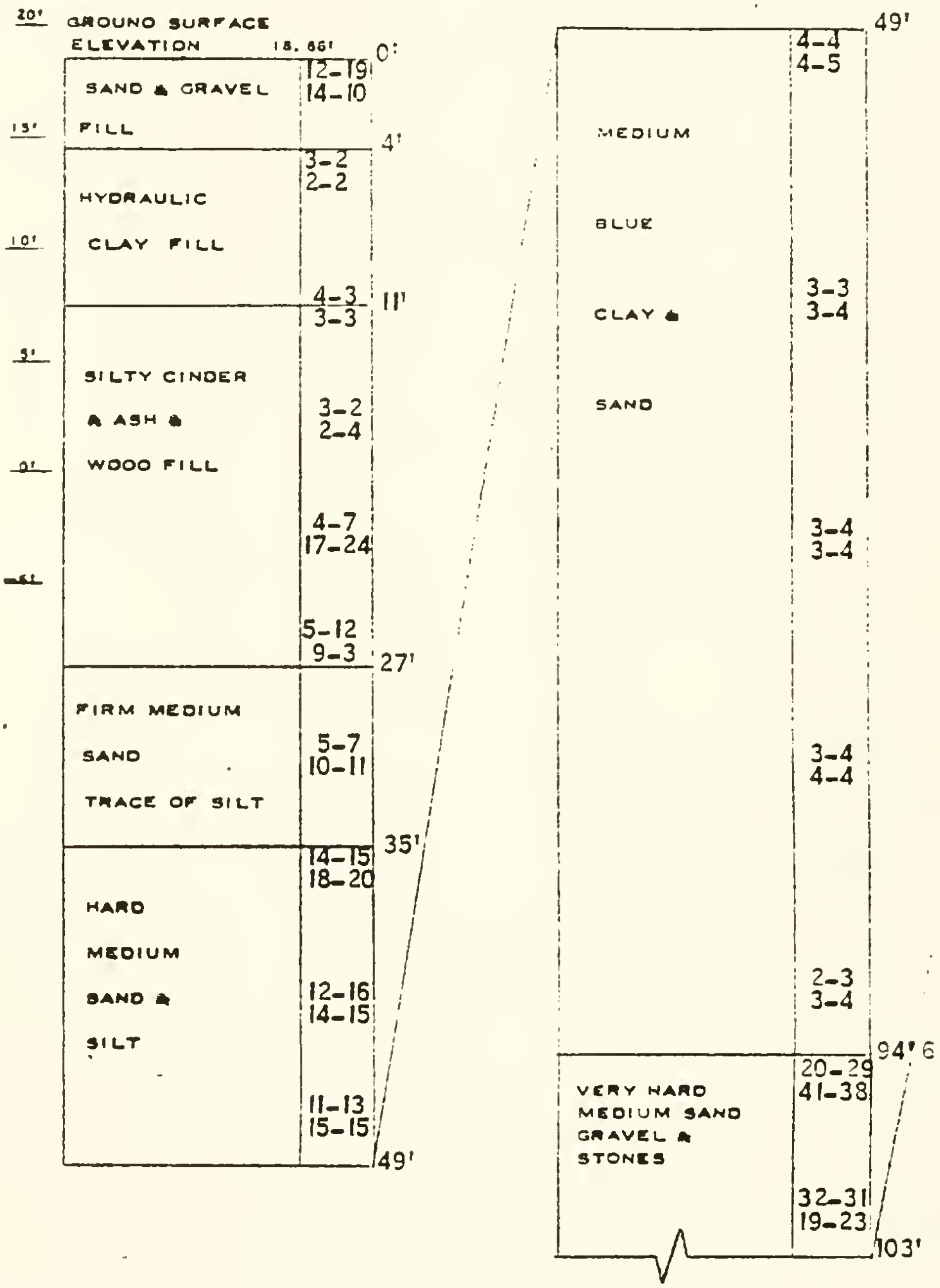
USED 40' OF 4'' CASING & 120' OF NX FLUSH JOINT.

NOTE. NO RECOVERY ON SAMPLE FROM 4'6'' TO 6'6''.

WATER LEVEL WAS NOTED AS TIDAL.

NOTE A.
FROM 117' TO 122'
DRILLED COBBLE TILL
WITH 14'' RECOVERY.

7-13-70



Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2″ O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman L. CREIGHTON

Classifications by FOREMAN

Job No. EB-17837-BCS

Sheet 11 of 15

F 344-3 50 PADS

TEST BORING REPORT

RAYMOND

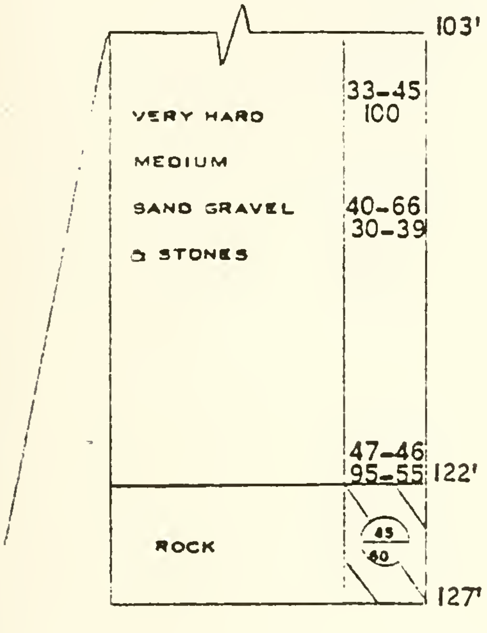
CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. R C 4 CONT.



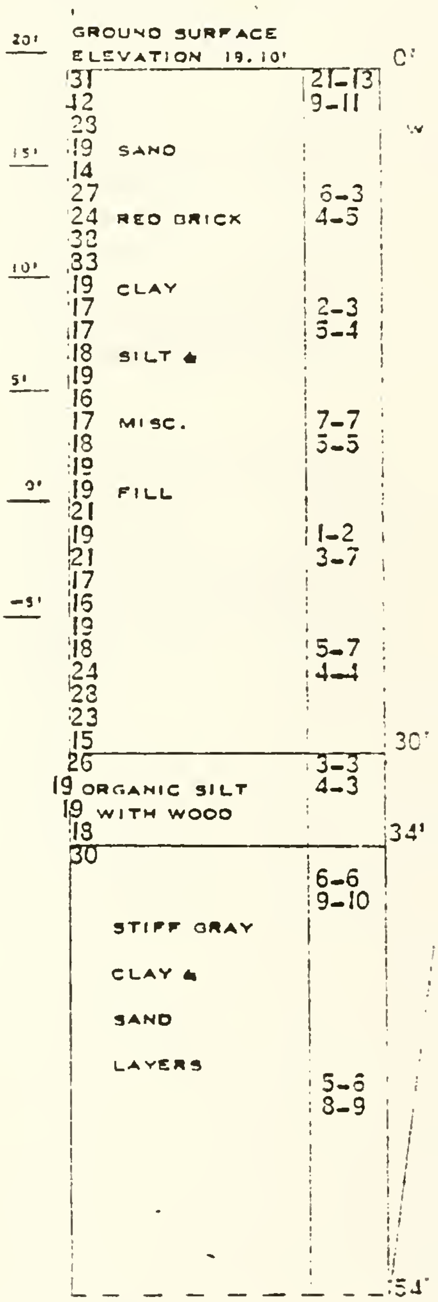
Boring No. R C 4 CONT.

USED 122' OF NX FLUSH JOINT CASING.

USED 30' OF 4" CASING

8-3-70

Boring No. R C 5



Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman B. RONAN

Classifications by FOREMAN

Job No. EB-17337-BCS

Sheet 12 of 15

F 344-B 50 PADS

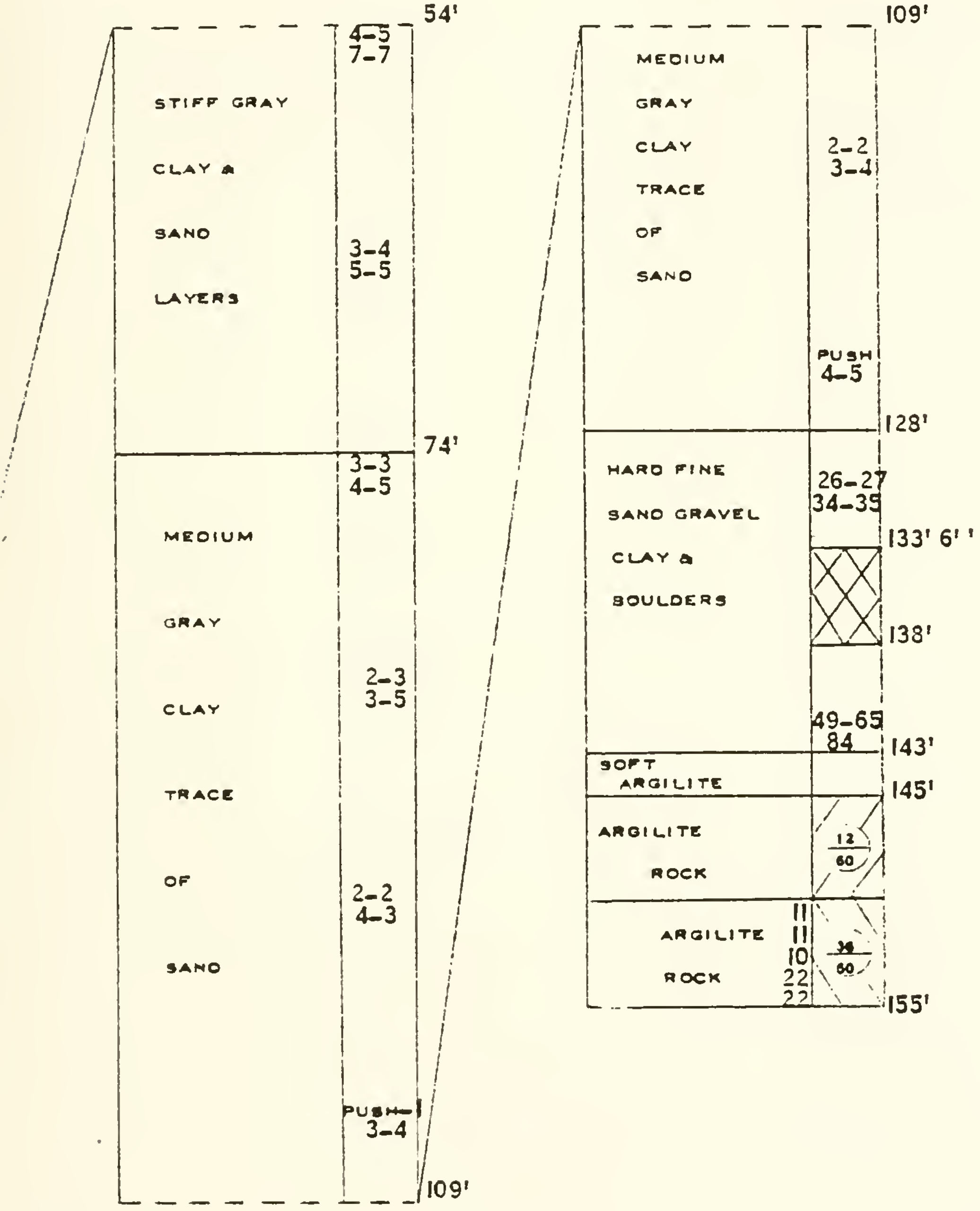
TEST BORING REPORT
RAYMOND
CONCRETE PILE DIVISION
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Boring PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. R C 5 CONT. Boring No. R C 5 CONT. Boring No. R C 5 CONT.



USED 35' OF 4'' CASING
& 145' OF NX FLUSH JOINT

WATER LEVEL NOTED AT
3'6'' BELOW SURFACE ON
COMPLETION, BUT NOTE
LEVEL IS TIDAL.

NOTE. DRILLED BOULDERS
FROM
133'6'' TO 138' 18'' RECOVERY

NOTE. PUSH INDICATES
THE SPLIT SPOON SAMPLER
WAS ADVANCED BY THE WT.
ONLY.

7-29-70

Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe using a 140 lb. weight falling 30 inches.

6 INCHES

Total Footage

Foreman B. RONAN

Classifications by FOREMAN

Job No. EB-17837-BOS

Sheet 13 of 15

544-3 50 PADS

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION

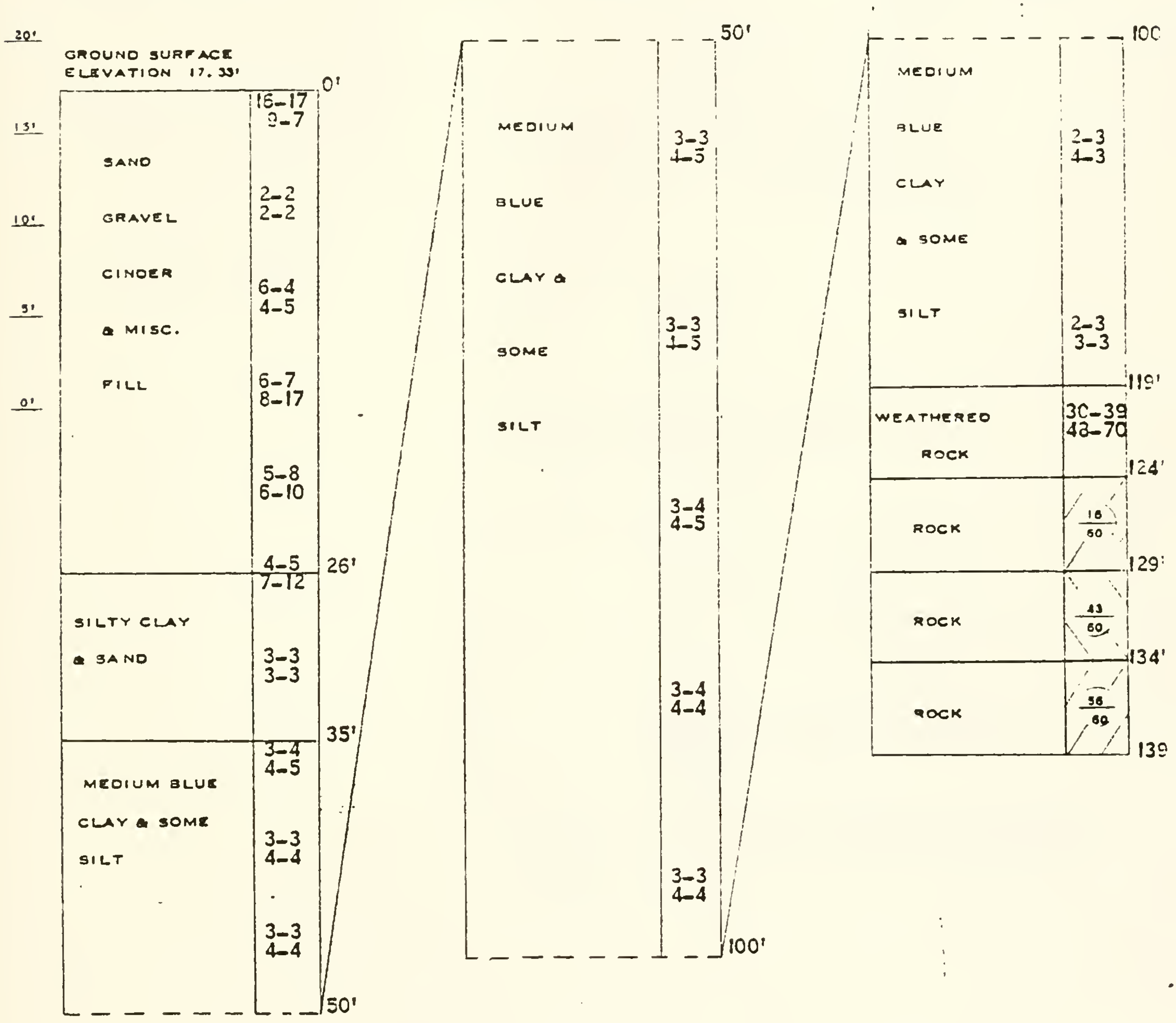
RAYMOND INTERNATIONAL INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as a fixed datum.

Boring No. R C 6 | Boring No. R C 6 CONT. | Boring No. R C 6 CONT.



Depth	Classification	Blows
0' – 26'	SAND GRAVEL CINDER & MISC. FILL	16-17 9-7 2-2 2-2 6-4 4-5 6-7 8-17 5-8 6-10 4-5
26' – 35'	SILTY CLAY & SAND	7-12 3-3 3-3
35' – 50'	MEDIUM BLUE CLAY & SOME SILT	3-4 4-5 3-3 4-4 3-3 4-4
50' – 100'	MEDIUM BLUE CLAY & SOME SILT	3-3 4-5 3-3 4-5 3-4 4-5 3-4 4-4 3-3 4-4
100' – 119'	MEDIUM BLUE CLAY & SOME SILT	2-3 4-3 2-3 3-3
119' – 124'	WEATHERED ROCK	30-39 48-70
124' – 129'	ROCK	18/60
129' – 134'	ROCK	43/60
134' – 139	ROCK	56/60

Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O. D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage

Foreman L. CREIGHTON

Classifications by FOREMAN

Job No. EB-17837-BOS

Sheet 14 of 15

TEST BORING REPORT

RAYMOND

CONCRETE PILE DIVISION

RAYMOND INTERNATIONAL, INC.

To HALEY & ALDRICH INC. Date AUGUST 24, 1970

Location of Borings PIER 4 AREA BOSTON, MASSACHUSETTS

All borings are plotted to scale of 1" = 8 ft. using ELEV. BY THE CLIENT as fixed datum.

Boring No. R C 6 CONT. Boring No. ______ Boring No. ______

USED 25' OF 4" CASING.

USED 120' OF NX FLUSH JOINT CASING.

WATER LEVEL NOTED AS TIDAL ON COMPLETION.

7-21-70

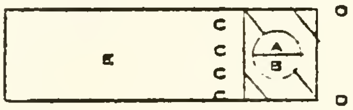
GENERAL NOTES

1) FIGURES SHOWN AS FRACTIONS

NUMERATOR - NUMBER OF BLOWS

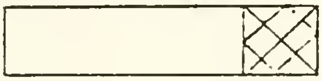
DEMONINATOR - PENETRATION IN INCHES

2) ROCK CORING

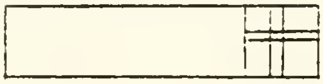


A. LENGTH OF CORE RECOVERY (IN INCHES)
B. LENGTH OF CORE RUN (IN INCHES)
C. TIME IN MINUTES TO CORE ONE FOOT.
D. FOOTAGE OF CORE RUN
E. CLASSIFICATION OF STRATA

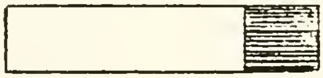
3) SYMBOL DEFINITIONS



BOULDER WITH DIAMOND BIT WITH OR WITHOUT RECOVERY



DRILLED COBBLE TILL WITH OR WITHOUT RECOVERY.



DRILLED WITH DIAMOND BIT THROUGH TILL.

4) NUMBERS IN THE EXTREME LEFT HAND COLUMN OF BORING INDICATE THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2.5" CASING ONE FOOT USING A 350 LB. WEIGHT FALLING 30 INCHES.

Classifications are made from visual inspection.

Water Levels (WL). Figure indicates time of reading (hours) after completion of boring. Water levels indicated are those observed when borings were made, or as noted. Porosity of the soil stratas, variations of rainfall, site topography, etc., may cause changes in these levels.

Figures in right hand column indicate number of blows required to drive 2" O.D. sampling pipe 6 INCHES using a 140 lb. weight falling 30 inches.

Total Footage ______

Foreman ______

Classifications by ______

Job No. EB-17337-BOS

Sheet 15 of 15

BORING REPORT

ATLANTIC TEST BORING CO. INC.

34 KING STREET
BOSTON, MASS. 02122

To HALEY & ALDRICH, INC.
238 MAIN STREET - CAMBRIDGE, MASSACHUSETTS
Date MARCH 15, 19 69 Job No. FILE NO. 1079
Location of Borings PIERS 1 & 2 NORTHERN AVENUE, BOSTON, MASS. (DIKE CONSTRUCTION)

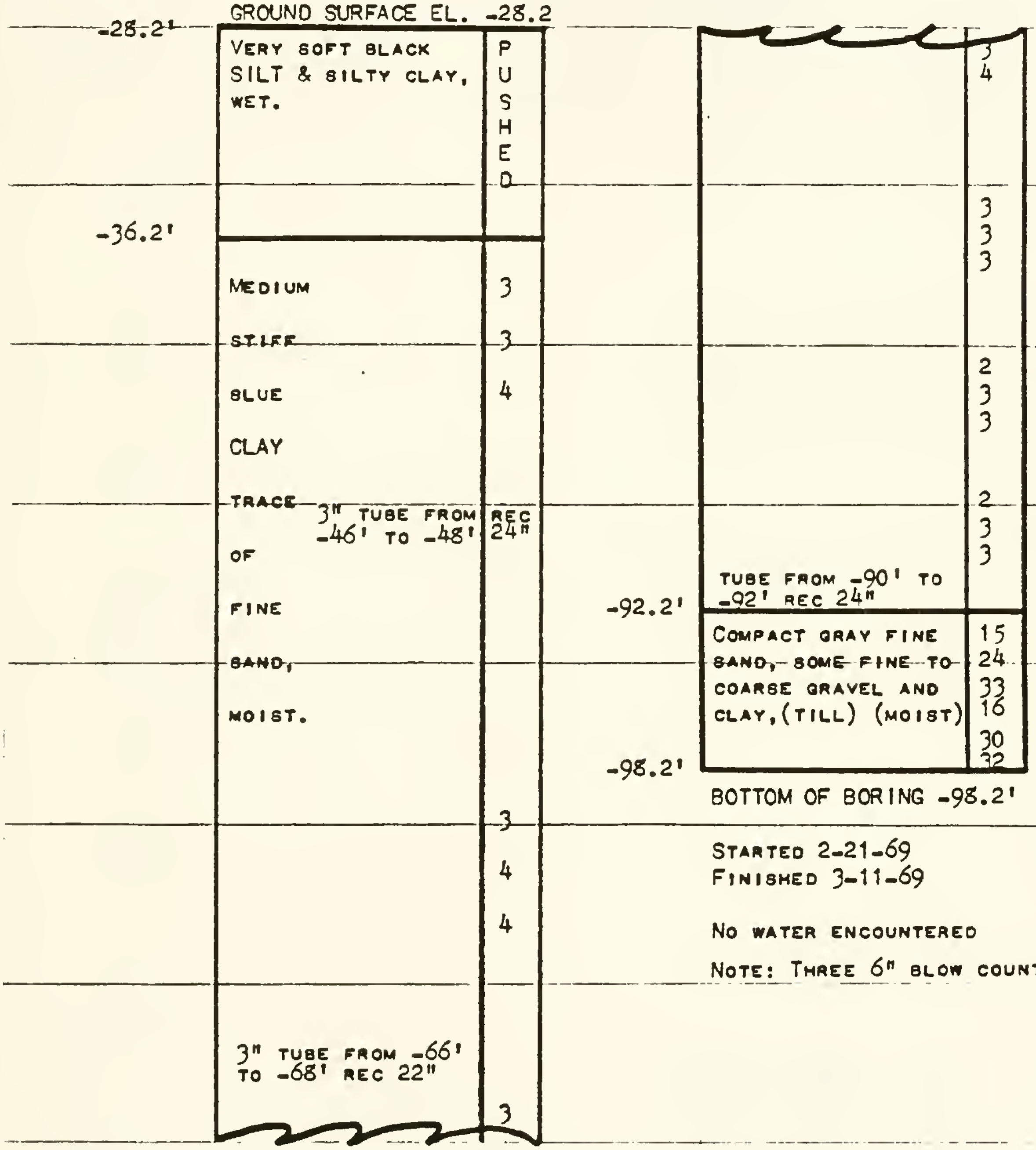
All borings are plotted to a scale of 1"= 6.0 ft. using ~~H.W.L~~. MLW as a fixed datum.

No.

No. AP-4

No. AP-4 ADVANCED

No.


GROUND SURFACE EL. -28.2
-28.2'
VERY SOFT BLACK SILT & SILTY CLAY, WET.
PUSHED
-36.2'
MEDIUM STIFF BLUE CLAY TRACE OF FINE SAND, MOIST.
3
3
4
3" TUBE FROM -46' TO -48'
REC 24"
3
4
4
3" TUBE FROM -66' TO -68' REC 22"
3
3
4
3
3
3
2
3
3
2
3
3
TUBE FROM -90' TO -92' REC 24"
-92.2'
COMPACT GRAY FINE SAND, SOME FINE TO COARSE GRAVEL AND CLAY, (TILL) (MOIST)
15
24
33
16
30
32
-98.2'

BOTTOM OF BORING -98.2'

STARTED 2-21-69
FINISHED 3-11-69

NO WATER ENCOUNTERED

NOTE: THREE 6" BLOW COUNTS (18")

Used 'of 4 "Casing

Used 'of 4 "Casing

Used 'of 4 "Casing

Total Footage 70.0'
Foreman P.J. MALONEY, JR.
Classification by P.J. MALONEY, JR.
Sheet 1 of 1

Figures in right hand column indicate number of blows required to drive sampling pipe one foot, using 140-lb. weight falling 30 inches.

DEPTH

ELEVATION

REPORT
HALEY & ALDRICH, INC.
238 MAIN STREET
CAMBRIDGE, MASS.

ATLANTIC TEST BORING CO., INC.
Diamond Drilling
SUBSURFACE INFORMATION

TOWN BOSTON, MASSACHUSETTS
PROJECT NAME ANTHONY'S PIER 4
PROJECT NO.

SHEET 1 OF 2
LOCATION ANTHONY'S PIER 4
HOLE NO. 101
LINE & STA.
OFFSET 30'-0" OFF EDGE OF PIER

GROUND WATER OBSERVATIONS
AT ____ FT. AFTER ____ HOURS
TIDE WATER
AT ____ FT. AFTER ____ HOURS

	CASING	SAMPLER	CORE BAR.
TYPE		S.S.	
SIZE I.D.	2½"	1-3/8"	
HAMMER WT.	350	140 LB.	BIT.
HAMMER FALL	24"	30"	

SURFACE ELEV. -11 (M.L.W. = 0)
DATE FINISH 3-21-68
BORING FOREMAN P.J. MALONEY
INSPECTOR JOHN HUMPHERY
SOILS ENGR. HALEY & ALDRICH

LOCATION OF BORING: 30'-0' OFF EDGE OF PIER - NOTE:

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	BLOWS PER 6 ON SAMPLER FROM 0-6	6-12	TO 12-18	DENSITY OR CONSIST. MOIST.	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.	SAMPLE NO.	PEN	REC.
0								-11.0'	COMPACT GRAY & BLACK SILTY, SANDY GRAVEL (GP) WET, FILL.			
		-13.0' TO -15.0'	D	16	22	30	WET			1	18	
		-18.0' TO -20.0'	D	14	18	15	WET		COMPACT GRAY & BLACK SILTY, SANDY GRAVEL (GM) WET, PROBABLE FILL.	2	18	
10								-21.0'				
		-22.0' TO -24.0'	D	3	3	3	MOIST		LOOSE GRAY FINE SANDY SILT (ML) MOIST.	3	18	
								-27.0'				
		-28.0' TO -30.0'	D	3	2	3	MOIST		SOFT GRAY-BLUE, FAT CLAY (CH), MOIST	4	18	
20												
		-33.0' TO -35.0'	D	3	3	3	MOIST			5	18	
		-38.0' TO -40.0'	D	3	2	3	MOIST			6	18	
30												
		-45.0' TO -47.0'	D	3	3	3	MOIST	-47.0'		7	18	
									REQUIRED DEPTH -47.0'			
40									DATE: STARTED 3-21-68 DATE: FINISHED 3-21-68			

GROUND SURFACE TO -30 FT. USED 2½ " CASING: THEN WASHED" CASING TO -45 FT.

SAMPLE TYPE:
D = DRY C = CORED P = PIT A = AUGER
UT = UNDISTURBED, THINWALL UP = UNDISTURBED, PISTON
PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME = 20-35%, AND = 35-50%

TOTAL FOOTAGE:
EARTH BORING 36.0' FT.
ROCK CORING ____ FT.

HOLE NO. 101

REPORT
HALEY & ALDRICH, INC.
238 MAIN STREET
CAMBRIDGE, MASS.

ATLANTIC TEST BORING CO., INC.
Diamond Drilling
SUBSURFACE INFORMATION

TOWN BOSTON, MASSACHUSETTS
PROJECT NAME ANTHONY'S PIER 4
PROJECT NO.

SHEET 2 OF 2
LOCATION ANTHONY'S PIER 4
HOLE NO. 102
LINE & STA.
OFFSET 15' OFF EDGE OF PIER

GROUND WATER OBSERVATIONS
AT ____ FT. AFTER ____ HOURS
TIDE WATER
AT ____ FT. AFTER ____ HOURS

	CASING	SAMPLER	CORE BAR.
TYPE		S.S.	
SIZE I.D.	2½"	1-3/8"	
HAMMER WT.	350	140	BIT.
HAMMER FALL	24"	30"	

SURFACE ELEV. -25 (M.L.W. = 0)
DATE FINISH 3/20/68
BORING FOREMAN P.J. MALONEY
INSPECTOR JOHN HUMPHREY
SOILS ENGR. HALEY & ALDRICH

LOCATION OF BORING: 15' OFF EDGE OF PIER

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	BLOWS PER 6 ON SAMPLER FROM TO 0-6	6-12	12-18	DENSITY OR CONSIST. MOIST.	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.	SAMPLE NO.	PEN	REC.
0								-25.0'	LOOSE GRAY & BLACK, SILTY, SANDY GRAVEL (GP) WET FILL.			
		-29.0' TO -31.0'	D	2	1	2	WET			1	18	
10		-33.0' TO -35.0'	D	3	2	4	WET		LOOSE GRAY & BLACK SANDY, CLAYEY SILT (ML) WET, TRACE OF GRAVEL & ORGANIC MATERIAL	2	18	
								-36.0'				
		-37.0' TO -39.0'	D	2	2	2	MOIST		SOFT GRAY-BLUE, FAT CLAY (CH) MOIST TO WET	3	18	
		-42.0' TO -44.0'	D	3	3	3	MOIST			4	18	
20												
		-49.0' TO -51.0'	D	3	4	4	MOIST			5	18	
30												
		-56.0' TO -58.0'	D	4	3	4	MOIST			6	18	
40		-63.0' TO -65.0'	D	4	3	4	MOIST		(CONT. NEXT SHEET)	7	18	

GROUND SURFACE TO ____ FT. USED ____ " CASING: THEN ____ " CASING TO ____ FT.

SAMPLE TYPE:
D = DRY C = CORED P = PIT A = AUGER
UT = UNDISTURBED, THINWALL UP = UNDISTURBED, PISTON

TOTAL FOOTAGE:
EARTH BORING ____ FT.
ROCK CORING ____ FT.

PROPORTIONS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME = 20-35%, AND = 35-50%

HOLE NO. 102

REPORT
HALEY & ALDRICH, INC.
238 MAIN STREET
CAMBRIDGE, MASS.

ATLANTIC TEST BORING CO., INC.
Diamond Drilling
SUBSURFACE INFORMATION
TOWN BOSTON, MASSACHUSETTS
PROJECT NAME ANTHONY'S PIER 4
PROJECT NO.

SHEET 2 OF 2
LOCATION ANTHONY'S PIER 4
HOLE NO. 102 CONT.
LINE & STA.
OFFSET 15' OFF EDGE OF PIER

GROUND WATER OBSERVATIONS
AT ____ FT. AFTER ____ HOURS
TIDE WATER
AT ____ FT. AFTER ____ HOURS

	CASING	SAMPLER	CORE BAR.
TYPE		S.S.	
SIZE I.D.	2½"	1-3/8"	
HAMMER WT.	350 LB.	140 LB.	BIT.
HAMMER FALL	24"	30"	

SURFACE ELEV. -25 (M.L.W. = 0)
DATE FINISH 3-20-68
BORING FOREMAN P.J. MALONEY
INSPECTOR JOHN HUMPHREY
SOILS ENGR. HALEY & ALDRICH

LOCATION OF BORING: 15' OFF EDGE OF PIER

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	BLOWS PER 6 ON SAMPLER FROM TO 0-6	6-12	12-18	DENSITY OR CONSIST. MOIST.	STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.	SAMPLE NO.	PEN	REC.
0								-65.0'				
									SOFT GRAY & BLUE, FAT CLAY (CH) MOIST TO WET			
		-70.0' TO -72.0'	D	3	4	4	MOIST			8	18	
10												
		-77.0' TO -80.0'	D	3	3	3	MOIST	-80.0'		9	18	
									REQUIRED DEPTH -80.0' STARTED: 3-15-68 FINISHED: 3-20-68			
20												
30												

ROUND SURFACE TO 40 FT. USED 2½ " CASING: THEN "PIPE" CASING TO -77.5 FT.
PLE TYPE:
Y C = CORED P = PIT A = AUGER
ISTURBED, THINWALL UP = UNDISTURBED, PISTON
IS USED: TRACE = 0-10%, LITTLE = 10-20%, SOME = 20-35%, AND = 35-50%

TOTAL FOOTAGE:
EARTH BORING 55.0' FT.
ROCK CORING ____ FT.

HOLE NO. 102

BORING REPORT

C. L. GUILD CONSTRUCTION CO., INC.

BORING REPORT

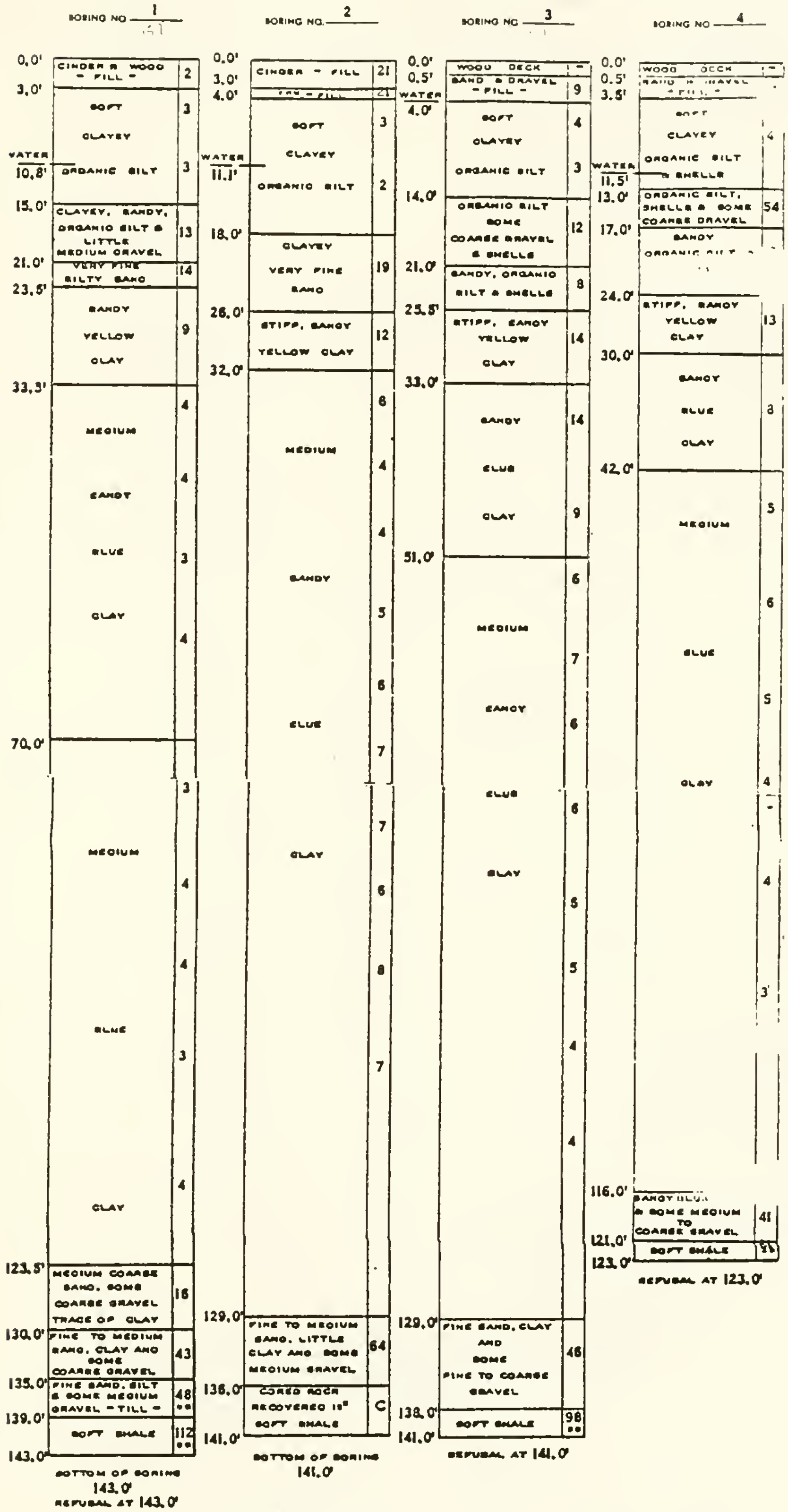
BOSTON　EAST PROVIDENCE

TO　Largo Construction Corp.　Boston, Massachusetts

SITE LOCATION　Proposed Apartment Buildings – Pier No. 2 –　BOSTON, Massachusetts

SCALE 1" = 10 FT.　REFERENCE DATUM　TO BE DETERMINED BY OTHERS.

ELEVATION



*** SAND, GRAVEL AND TRACE OF WOOD FILL.

NOTES – ** DENOTES USED 300 LB WT ON OPEN END A ROD TO GAIN PENETRATION.

ALL WATER LEVEL READINGS AFFECTED BY TIDE.

*INDICATES MUD LOST IN THIS LAYER OF SOIL　FOOTAGE OF BORING THIS SHEET 546.0'

WATER READING INDICATES SURFACE OF WATER AT COMPLETION OF BORING UNLESS NOTED OTHERWISE. FIGURES IN LOG COLUMN INDICATE NUMBER OF BLOWS TO DRIVE 2" SPLIT SAMPLER 12 INCHES WITH 140 LB. WEIGHT FALLING 30 INCHES UNLESS OTHERWISE SPECIFIED.

SHEET 2 OF 3　FOREMAN ____ SP ____ CLASSIFICATION BY ____ SP & JEH ____ JOB NO B-3039

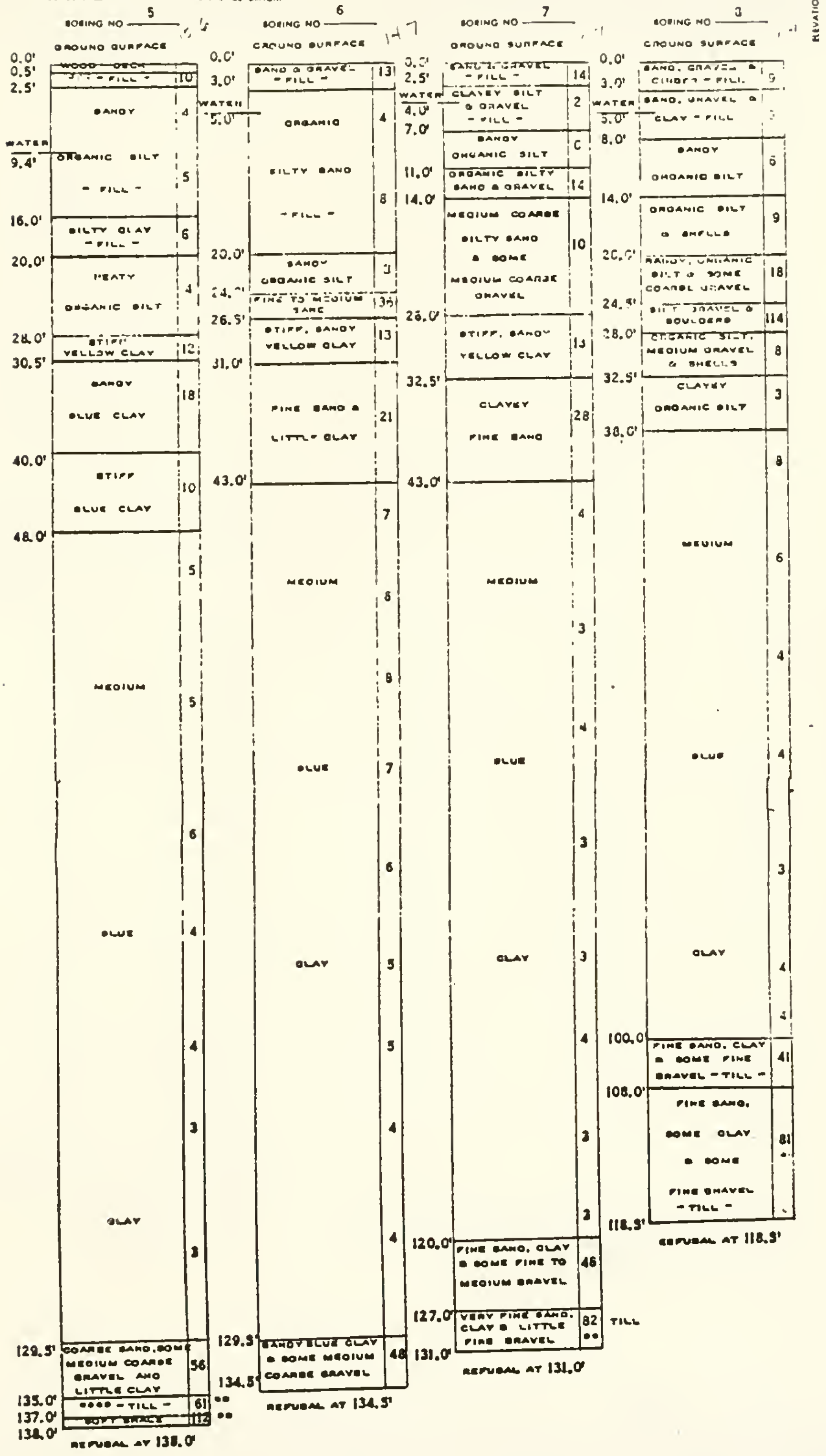
BORING REPORT **C. L. GUILD CONSTRUCTION CO., INC.** BORING REPORT

BOSTON EAST PROVIDENCE

TO Largo Construction Corp. Boston, Massachusetts

SITE LOCATION Proposed Apartment Building - Pier No. 2 - BOSTON, Massachusetts

SCALE 1" = 10 FT REFERENCE DATUM TO BE DETERMINED BY OTHERS.



** SAND, GRAVEL AND
WOOD - FILL -

**** FINE SAND, SOME
FINE TO MEDIUM
GRAVEL & LITTLE CLAY.

12-23 & 24-64 12-21 & 22-64 12-19 & 21-64 12-18 & 19-64

*INDICATES MUD LOST IN THIS LAYER OF SOIL FOOTAGE OF BORING THIS SHEET 522.0'

WATER READING INDICATES SURFACE OF WATER AT COMPLETION OF BORING UNLESS NOTED OTHERWISE. FIGURES IN LOG COLUMN INDICATE NUMBER OF BLOWS TO DRIVE 2" SPLIT SAMPLER 12 INCHES WITH 140 LB. WEIGHT FALLING 30 INCHES UNLESS OTHERWISE SPECIFIED.

SHEET 1 OF 3 FOREMAN GP CLASSIFICATION BY GP & JEM JOB NO B-3039

BORING REPORT

C. L. GUILD CONSTRUCTION CO., INC.

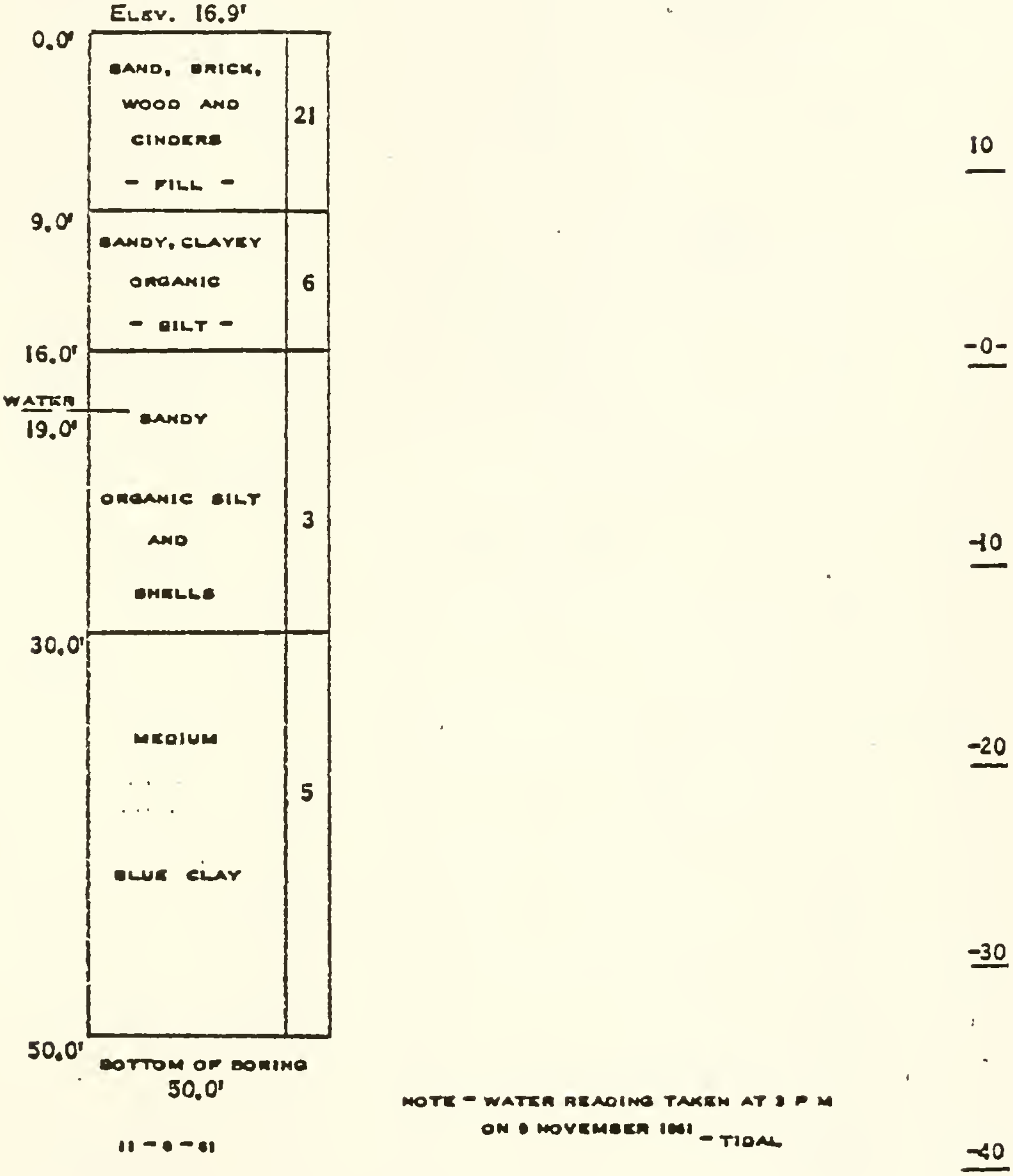
BOSTON

EAST PROVIDENCE

BORING REPORT

TO .... Messina Builders .... 101 Summer Street .... Brockton Heights, Massachusetts
SITE LOCATION Proposed Building Site – Pier 2, Northern Avenue – SOUTH BOSTON, Massachusetts
SCALE 1"= 8 FT. REFERENCE DATUM FURNISHED BY MESSINA BUILDERS

BORING NO. .... BORING NO. 2 .... BORING NO. .... BORING NO. ....



11 – 8 – 61

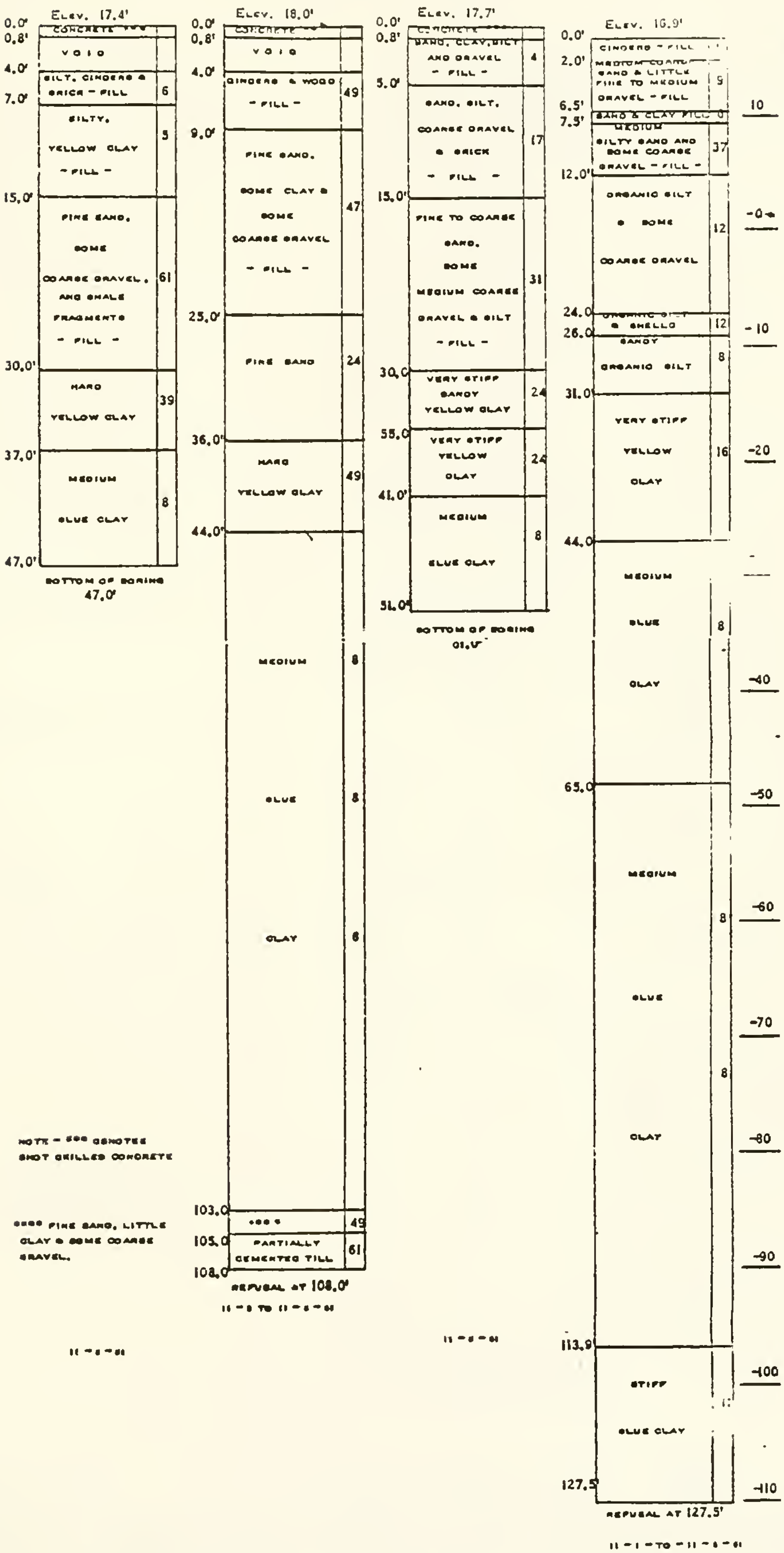
NOTE – WATER READING TAKEN AT 3 P M ON 8 NOVEMBER 1961 – TIDAL

*INDICATES MUD LOST IN THIS LAYER OF SOIL .... FOOTAGE OF BORING THIS SHEET .... 50.0'
WATER READING INDICATES SURFACE OF WATER AT COMPLETION OF BORING UNLESS NOTED OTHERWISE. FIGURES IN LOG COLUMN INDICATE NUMBER OF BLOWS TO DRIVE 2" SPLIT SAMPLER 12 INCHES WITH 140 LB. WEIGHT FALLING 30 INCHES UNLESS OTHERWISE SPECIFIED.
SHEET 2 OF 3 FOREMAN L.P. & R.M. CLASSIFICATION BY L.P., S.M. & J.E.M. JOB NO. B-2426

BORING REPORT **C. L. GUILD CONSTRUCTION CO., INC.** BORING REPORT
BOSTON EAST PROVIDENCE

TO Messina Builders 101 Summer Street Brockton Heights, Massachusetts
SITE LOCATION Proposed Building Site - Pier 2, Northern Avenue - SOUTH BOSTON, Massachusetts
SCALE 1" = 8 FT. REFERENCE DATUM FURNISHED BY MESSINA BUILDERS

BORING NO. 4 BORING NO 5 BORING NO 6 BORING NO 7



NOTE - *** DENOTES SHOT DRILLED CONCRETE

**** FINE SAND, LITTLE CLAY & SOME COARSE GRAVEL.

*INDICATES MUD LOST IN THIS LAYER OF SOIL FOOTAGE OF BORING THIS SHEET 333.5'
WATER READING INDICATES SURFACE OF WATER AT COMPLETION OF BORING UNLESS NOTED OTHERWISE. FIGURES IN LOG COLUMN INDICATE NUMBER OF BLOWS TO DRIVE 2" SPLIT SAMPLER 12 INCHES WITH 140 LB. WEIGHT FALLING 30 INCHES UNLESS OTHERWISE SPECIFIED
SHEET 2 OF 3 FOREMAN LR & RH CLASSIFICATION BY LR, AM & JEM JOB NO. B - 2426

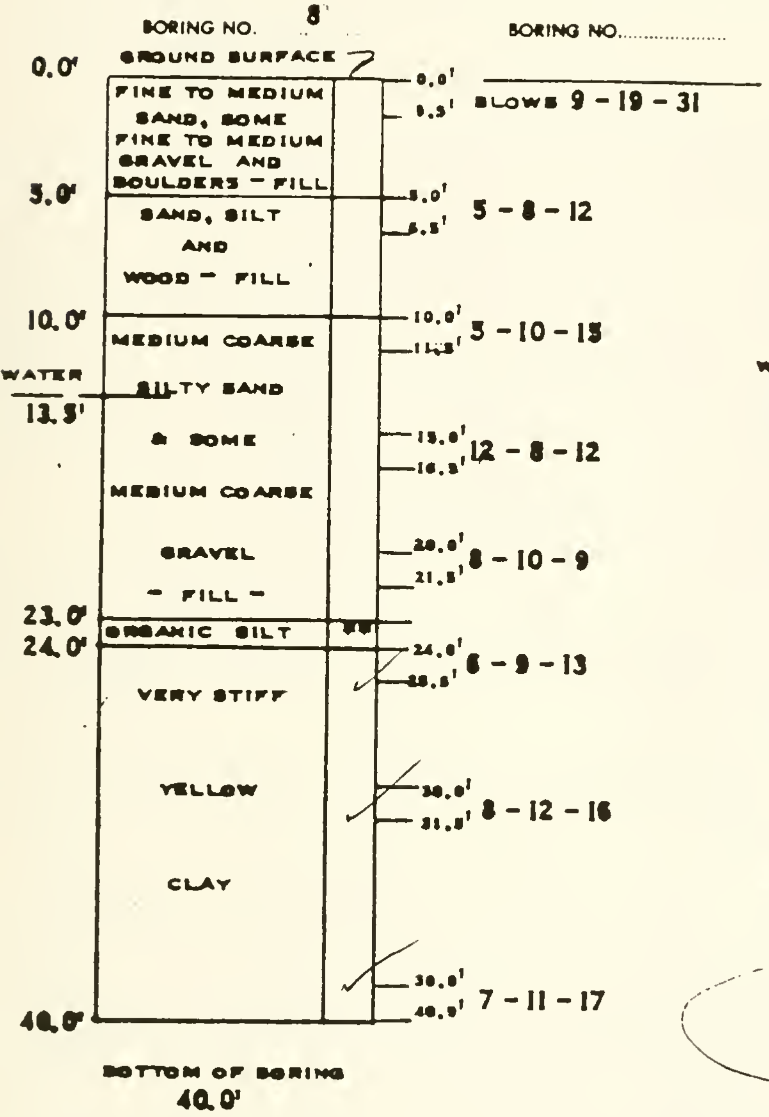
BORING REPORT **C. L. GUILD CONSTRUCTION CO., INC.** BORING REPORT

BOSTON EAST PROVIDENCE

TO HALEY & ALDRICH - 238 MAIN STREET - CAMBRIDGE, MASSACHUSETTS

SITE LOCATION PROP. BUILDING SITE - PIER NO. 4, NORTHERN AVENUE - BOSTON, MASSACHUSETTS

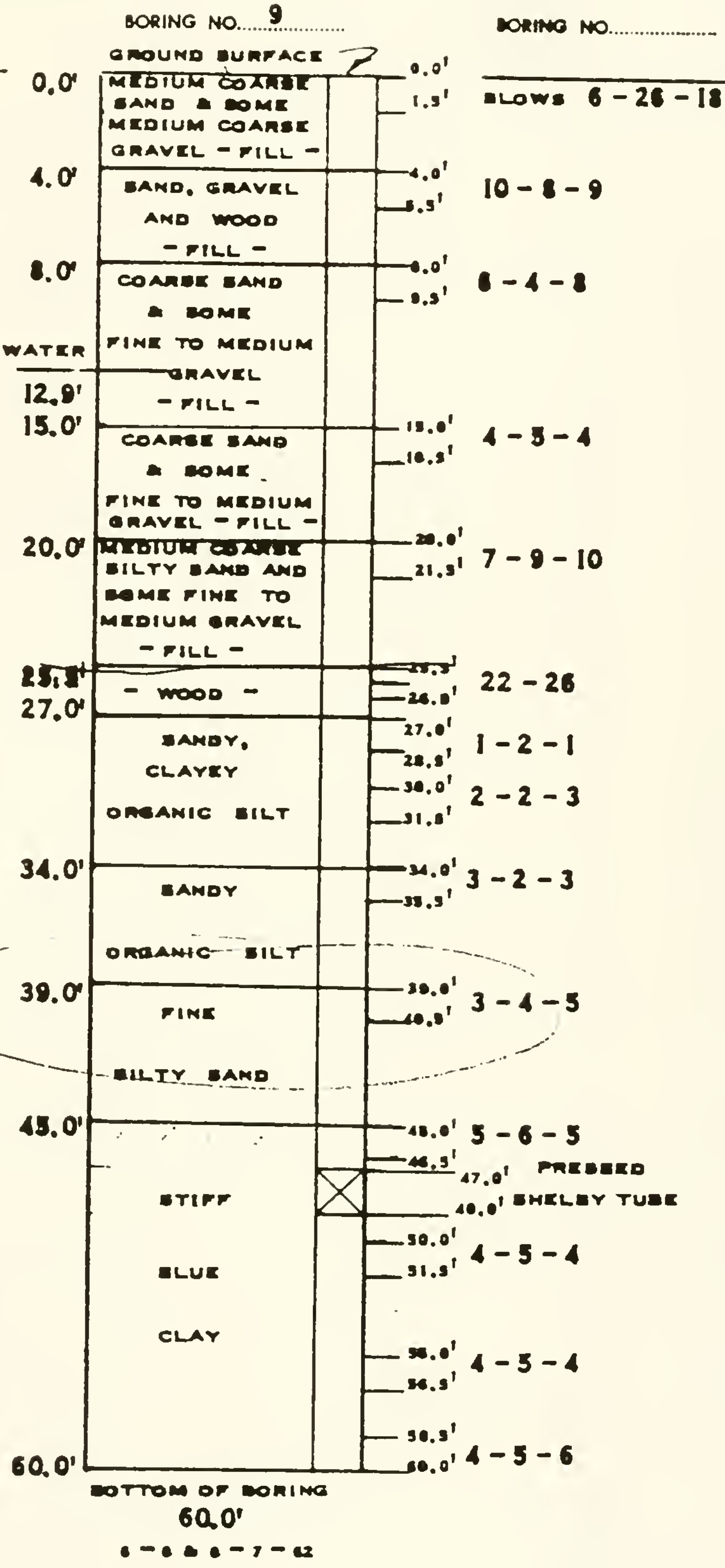
SCALE 1"= 8 FT. REFERENCE DATUM TO BE DETERMINED BY OTHERS



** DENOTES COULD NOT RECOVER SAMPLE IN THIS STRATA.

NOTE - ALL BORINGS STOPPED AT DEPTHS INDICATED PER ORDER OF HALEY & ALDRICH.

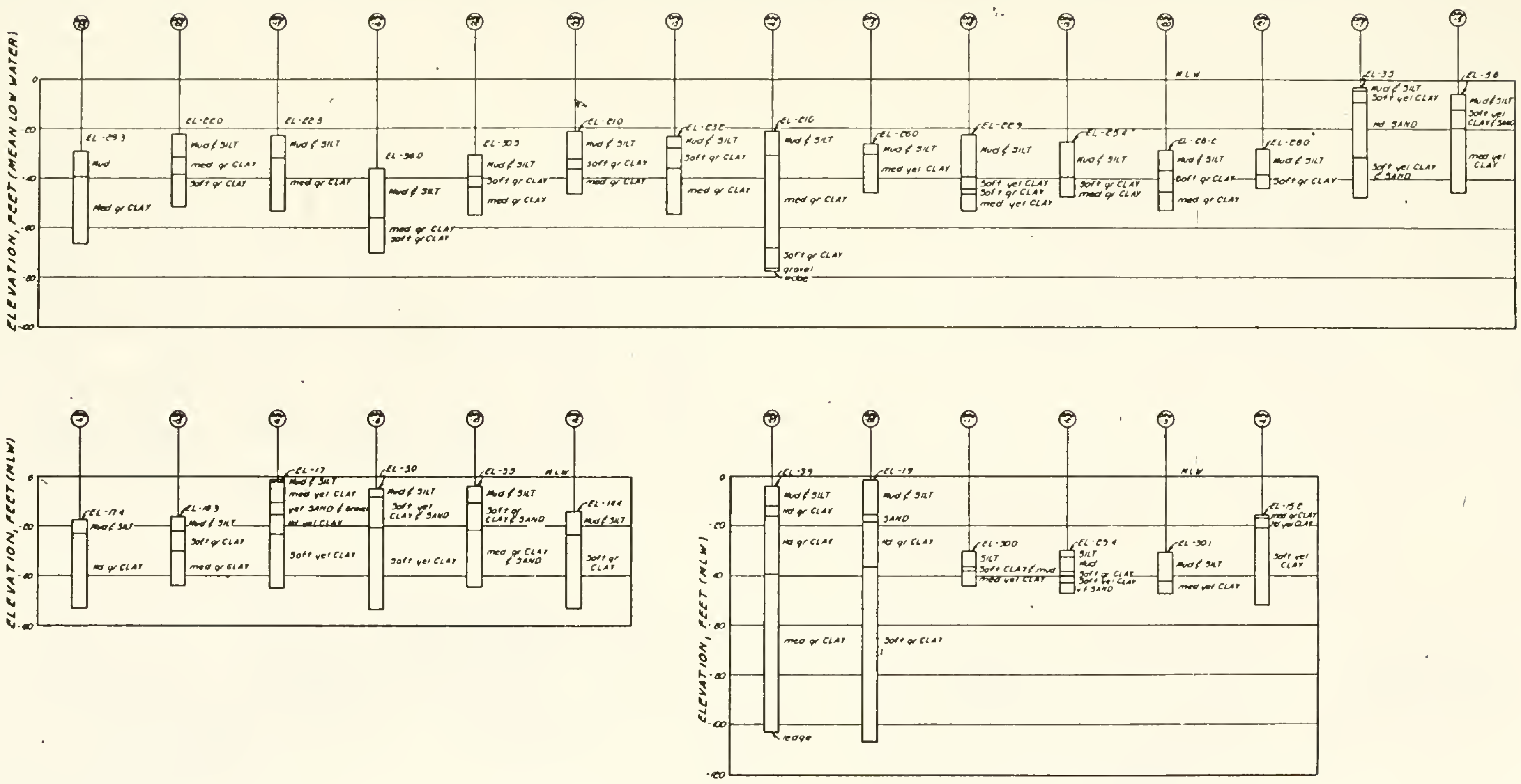
6-5-62



*INDICATES MUD LOST IN THIS LAYER OF SOIL .... FOOTAGE OF BORING THIS SHEET 100.0'

WATER READING INDICATES SURFACE OF WATER AT COMPLETION OF BORING UNLESS NOTED OTHERWISE. FIGURES IN LOG COLUMN INDICATE NUMBER OF BLOWS TO DRIVE 2" SPLIT SAMPLER 6 INCHES WITH 140 LB. WEIGHT FALLING 30 INCHES UNLESS OTHERWISE SPECIFIED.

SHEET 2 OF 3 FOREMAN DP CLASSIFICATION BY DP & JEH JOB NO. B - 2538



NOTE

For Legend and Notes see Figure 9

WATERFRONT DEVELOPMENT
NORTHERN AVENUE
BOSTON, MASSACHUSETTS

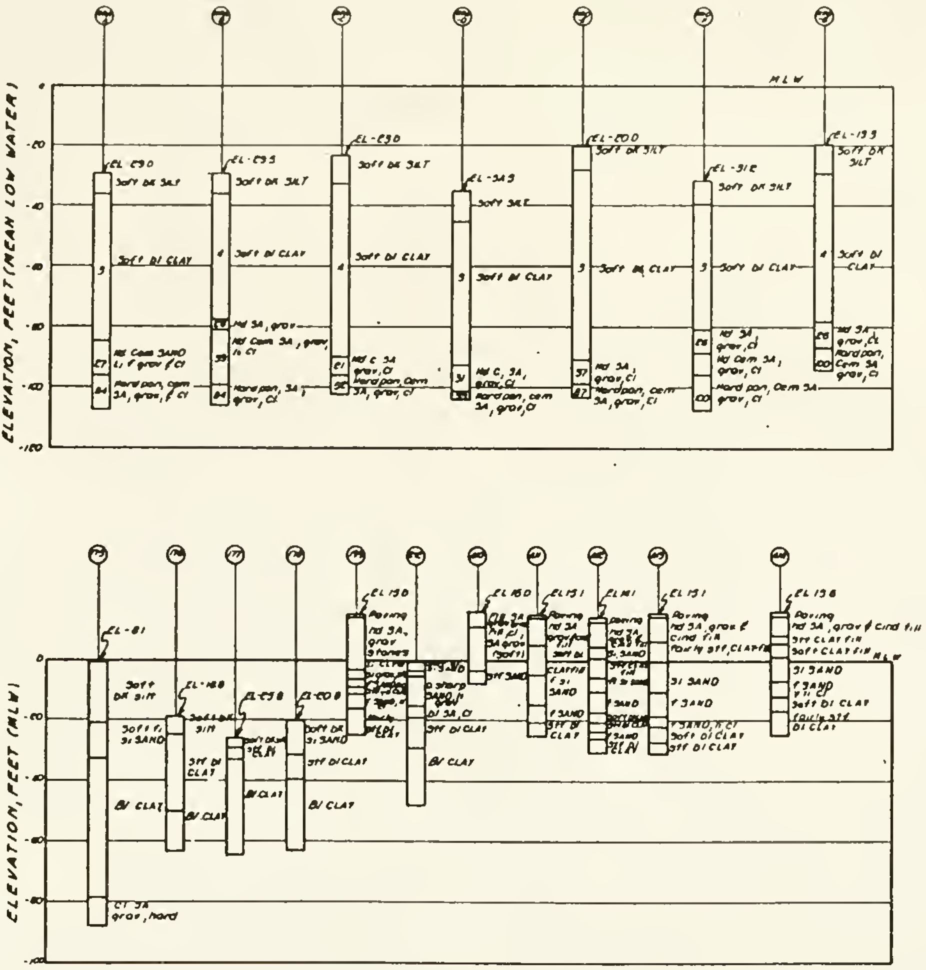
SUMMARY OF PREVIOUS BORINGS

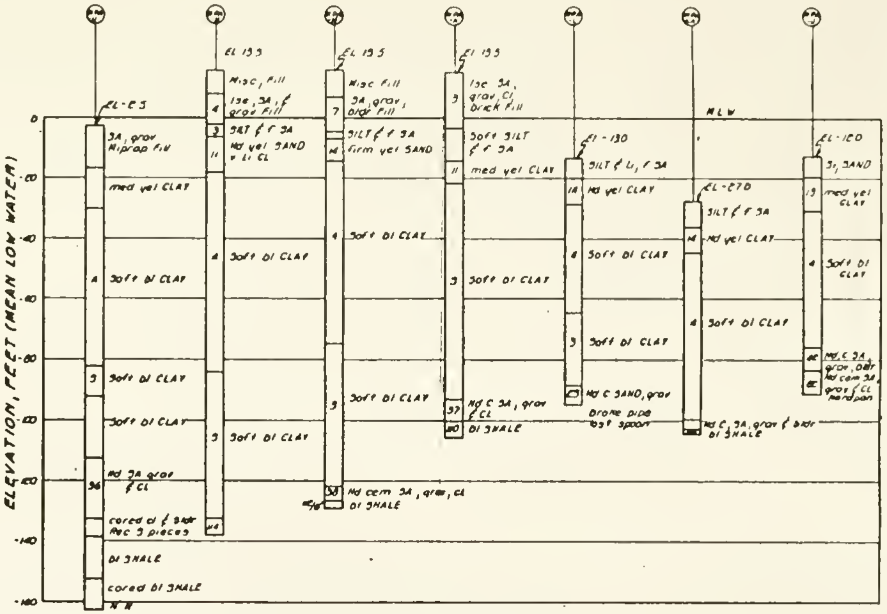
Scale: Vertical
Horizontal not to scale
November 1970

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

FILE NO. 1079

FIGURE





LEGEND

Logs of test borings completed for the Massachusetts Department of Public Works in 1940.

Logs of test borings recorded in the Journal of the Boston Society of Civil Engineers, October 1961.

Logs of test borings completed for the Boston Port Authority during 1951.

El. — Ground Surface Elevation

Figures in log column indicate number of blows required to drive sampler 12 inches.

DENSITY OR CONSISTENCY

lse. - loose
med. - medium
comp. - compact
stf. - stiff
hd. - hard

COLOR

bk. - black
gr. - gray
yel. - yellow
bl. - blue

SOIL COMPONENTS

Cl. - Clay or clayey
Si. - Silt or silty
SA - Sand or sandy
Cind - Cinder or cindery
Grav - Gravel or gravelly
bldr. - boulder
wd - wood or woody
sh. - shells

MISCELLANEOUS

Cem - cemented
c. - coarse
m. - medium
f. - fine
v. - very
Li - little
Rec - Recovery
N R - No Recovery
Misc - miscellaneous

NOTES

1. For locations of borings see Figure 2.
2. Reference Datum is Mean Low Water. To correct elevations to Boston City Base Datum, add 0.81. Note that ground elevations shown on Figures 2 through 8 are referenced to Boston City Base.

WATERFRONT DEVELOPMENT
NORTHERN AVENUE
BOSTON, MASSACHUSETTS

SUMMARY OF PREVIOUS BORINGS

Scales: Vertical
Horizontal not to scale
November 1970

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

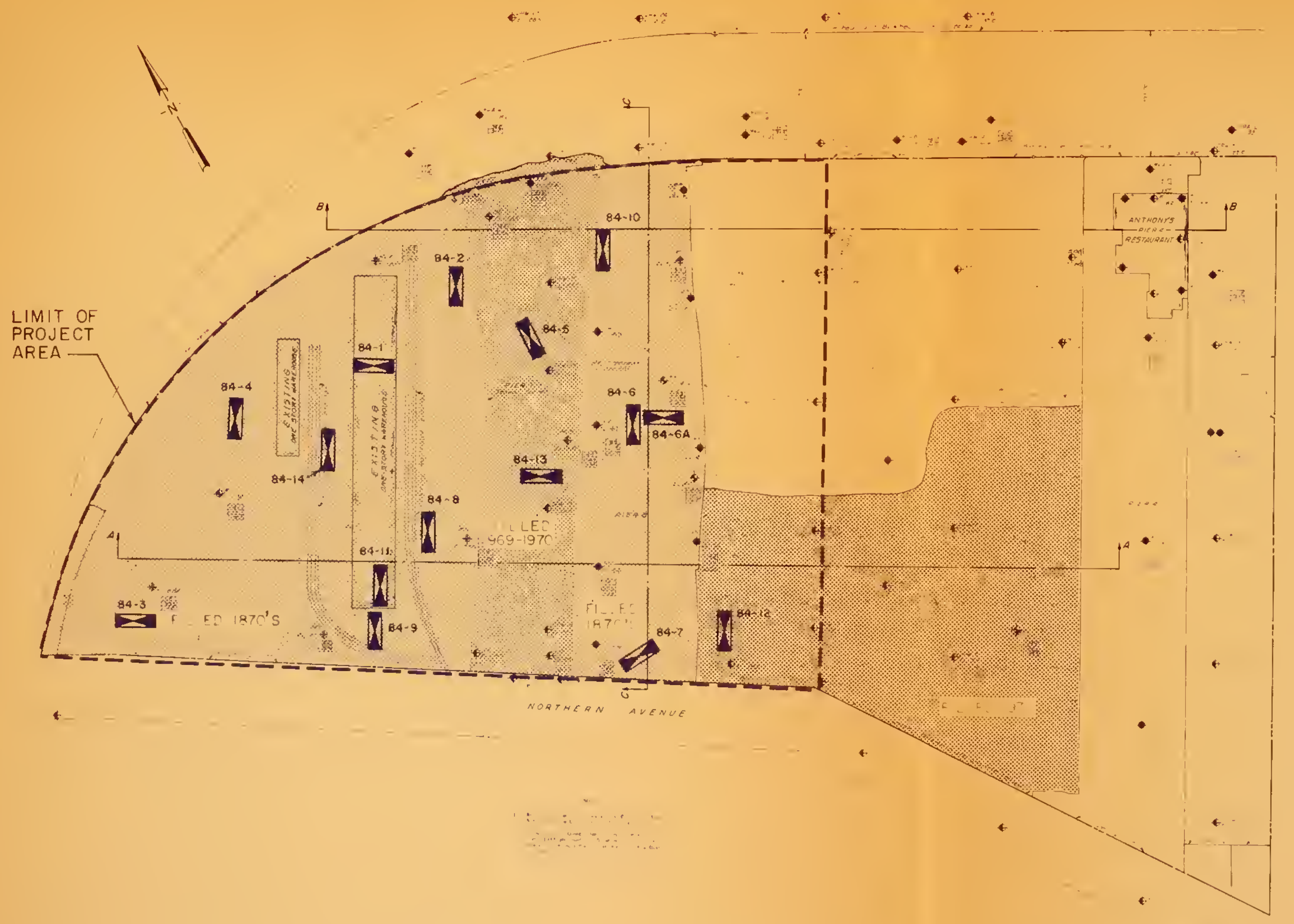
FILE NO. 1078

FIGURE 9

Appendix B

APPENDIX B

Test Pit Logs 84-1 to 84-14



PLAN PREPARED FROM DATA
PRESENTED IN 1971 H&A REPORT

LEGEND

- ◆ DPW 3 Refusal Boring
- ◆ Shallow Boring
- ◆ DPW 3 Location of test borings completed for the Mass. Department of Public Works in 1940
- ◆ 212 Location of test borings recorded in the Journal of the Boston Society of Civil Engineers, October 1951
- ◆ MPA Location of test borings completed for the Port of Boston Authority during 1951
- ◆ 7 Location of 2½ in. diameter standard test borings by C. L. Guild Const. Co. during November 1961
- ◆ G Location of 2½ in. diameter standard test borings to refusal by C. L. Guild Const. Co. during December 1964 in Appendix B
- ◆ B101 Location of 2½ in. diameter standard test borings completed by Atlantic Test Boring Co. during March 1968. Logs
- ◆ AP4 Location of 3½ in. diameter test boring with undisturbed piston tube samples completed by Atlantic Test Boring Co. during March 1969. Log presented in Appendix D
- ◆ B1 Location of 2½ in. diameter standard test borings completed by Raymond Concrete Pile Division during July-August 1970
- ◆ RC Location of test borings, in which NX rock cores of bedrock were obtained using Christensen barrel. Borings made by Raymond Concrete Pile Division during July August 1970
- ◆ RC 1 Location of test borings in which NX rock cores of bedrock were obtained using Christensen barrel. Borings made by Atlantic Test Boring Co. during July 1970

A Top Elevation of Natural Inorganic Soil
B Top Elevation of Till
C Top Elevation of Bedrock

84-2 LOCATION OF MACHINE EXCAVATED TEST PITS FOR ENVIRONMENTAL ASSESSMENT PURPOSES BY MARCHESE & SONS, EVERETT, MASS., OCTOBER 1984
REFER TO APPENDIX B

HALEY & ALDRICH, INC.
CAMBRIDGE MASSACHUSETTS
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

PIERS 1-2-3
MASTER PLAN DEVELOPMENT
BOSTON, MASSACHUSETTS

SITE AND SUBSURFACE EXPLORATION
LOCATION PLAN

SCALE: 1" = 200'
OCTOBER 1984

FIGURE B-1

FILE NO 5556 B13

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-1

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA

CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.

CONTRACTOR: MARCHESE & SONS, EVERETT, MA

EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556

LOCATION. See Plan

ELEVATION: 18±

EXPLORATION DATE: 4 Oct. 84

H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	1.8			Dark brown-dark grayish-black silty coarse to fine SAND, some coarse to fine gravel, trace coarse sand, cobbles, brick, tile, loam, small boulders.	
2	2.6			Dark brown silty medium to fine SAND, little coarse to fine gravel, trace coarse sand, wood, glass, tile, brick, cobbles.	
	2.7			Black CINDERS.	
4	4.0			Tan brown fine SAND, little silt, trace coarse to medium sand and coarse to fine gravel, few small cobbles.	
	4.7 5.2			Brown to rust brown coarse to fine SAND, trace coarse to fine gravel, silt, cobbles with pockets of gravelly sand.	
6				Yellow brown mottled silty CLAY, trace blue-gray, slightly organic silt pockets, fine sand.	
	7.0			Blue-gray very slightly organic clayey SILT, some fine sand, trace black organic silt pockets.	
8 10 12				Blue-gray very slightly organic to inorganic silty CLAY with some fine sand.	Note: All materials encountered in all test pits consisted of various types of fill, the repetitive use of "FILL" has been deleted from the log descriptions.
				Bottom of Exploration 12.5 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.
Soil damp at 5.0 ft.		
but no water entering pit.		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

12 (L) x 3 (W) x 12.5 (D) = 450 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. 5 = Vol. 5 Cu. Ft.

Over 18" DIAM: No. 2 = Vol. 8 Cu. Ft.

SUMMARY

DEPTH 12.5 ft.

JAR SAMPLES –

BAGSAMPLES –

GROUNDWATER –

TEST PIT NO. 84-1

H & A FORM 24 NOV. 78

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-2

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA
CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.
CONTRACTOR: MARCHESE & SONS, EVERETT, MA
EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 18.5±
EXPLORATION DATE: 4 Oct. 84
H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	1.3			Dark brown medium to fine SAND, little silt and coarse to fine gravel, trace coarse sand, cobbles, brick, concrete, granite blocks, bituminous pavement and loam.	See note TP 84-1
2	2.9	B1	1.0 to 2.9	Dark gray silty medium to fine SAND, little coarse to fine gravel, trace coarse sand, brick, concrete, wood, loam, shells, metal, glass, fibrous peat chunks.	Trapped water entered pit slowly at 9.5 ft.
4	4.9			Yellow-brown to gray-brown clayey SILT, some fine sand, trace cinders, pottery, loam, gravel, wood (1'X2' pocket black cinders in pit wall).	
6	6.5			Yellow-brown to gray-brown mottled silty CLAY, trace brick, wood, cinders, gravel, small log.	
8 10	10.0			Black to dark gray silty medium to fine SAND, trace coarse to fine gravel, wood, brick, cobbles, shells, stumps, metal (slight petroleum odor).	Soil wet.
12				Yellow-brown to gray-brown mottled silty CLAY, little fine sand, trace brick fragments, wood, coarse sand, fine gravel with pockets of silty sand.	
				Bottom of Exploration 12.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		

NOT ENCOUNTERED X * HRS. AFTER COMPL.

15 (L) x 4 (W) x 12 (D) = 720 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. 3 - Vol. 3 Cu. Ft.
Over 18" DIAM: No. - - Vol. - Cu. Ft.

SUMMARY

DEPTH 12.0 ft.
JAR SAMPLES -
BAGSAMPLES 1 Bag
GROUNDWATER -
TEST PIT NO. 84-2

H & A FOR NOV. 78 24

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-3

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA

CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.

CONTRACTOR: MARCHESE & SONS, EVERETT, MA

EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556

LOCATION: See Plan

ELEVATION: 19±

EXPLORATION DATE: 4 Oct. 84

H & A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	0.4			Dark gray crushed STONE.	
2	2.0			Black silty medium to fine SAND, little coarse to fine gravel, trace cinders, ash, wood, metal, brick, small boulders.	
4	5.0			Yellow-brown medium to fine SAND, little silt, trace coarse sand and coarse to fine gravel.	See note TP 84-1
6		B1	6.0 to 8.0	Dark bluish gray very slightly organic clayey SILT to silty CLAY, some fine sand, trace wood, shells, fine gravel, cobbles with pockets of silty fine sand to fine sandy silt.	Trapped water entered pit rapidly at 4.5 ft.
8					
10					
12				Bottom of Exploration 12.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

15 (L) x 4 (W) x 12 (D) = 720 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – = Vol. – Cu. Ft.

Over 18" DIAM: No. – = Vol. – Cu. Ft.

SUMMARY

DEPTH 12.0 ft.

JAR SAMPLES –

BAGSAMPLES 1 Bag

GROUNDWATER –

TEST PIT NO. 84-3

H & A FOR NOV. 78 24

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-4

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA
CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.
CONTRACTOR: MARCHESE & SONS, EVERETT, MA
EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 19±
EXPLORATION DATE: 4 Oct. 84
H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	0.4			Dark brown loamy SILT, some medium to fine sand, trace gravel and roots.	See note TP 84-1
	1.0			RAILROAD TIES in loamy silt matrix.	
	1.4			Black silty SAND, trace cinders and gravel.	
2	1.8			Yellow-brown to gray silty fine SAND.	Obtained samples for chemical testing at 2.0 ft.
	2.2			Black silty fine SAND, trace coarse to medium sand and fine gravel.	
4	3.8			Grayish brown medium to fine SAND, little silt, coarse to fine gravel, cobbles, small boulders, with pockets of black sand, trace gravel.	Trapped water entered pit very rapidly at 4.2 ft.
6 8 10				Brownish gray to yellow-brown mottled silty CLAY, little fine sand, trace black very slightly organic silt pockets, shells and pockets of fine sand.	
12				Bottom of Exploration 12.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

15 (L) x 4 (W) x 12 (D) = 720 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – = Vol. – Cu. Ft.
Over 18" DIAM: No. – = Vol. – Cu. Ft.

SUMMARY

DEPTH 12.0 ft.
JAR SAMPLES –
BAGSAMPLES –
GROUNDWATER –
TEST PIT NO. 84-4

H & A FOR NOV. 78 24

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-5

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA

CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.

CONTRACTOR: MARCHESE & SONS, EVERETT, MA

EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556

LOCATION: See Plan

ELEVATION: 18±

EXPLORATION DATE: 4 Oct. 84

H & A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
2				Brown intermixed silty SAND, some gravel, little brick, shells, trace wood, metal, concrete, granite blocks, cobbles, small boulders.	
4	3.6			Brownish yellow-gray silty CLAY, some sand, trace brick, wood, gravel, cobbles, metal with medium to fine sand pockets.	
	4.7			Dark reddish brown silty SAND, little brick, trace clay, wood, cobbles.	
6	5.4			Yellow-brown to gray mottled silty CLAY, some sand, trace dark brown loam pockets with silt and fine sand pockets, trace gravel and lumps of peat.	
8 10	8.0			Bluish gray clayey SILT, little fine sand, trace black pockets, very slightly organic clayey silt, trace gravel and small cobbles, pockets of loam, wood, shells.	No water entered pit after 1.0 hr. See note TP 84-1
12				Bottom of Exploration 12.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

15 (L) x 4 (W) x 12 (D) = 720 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – = Vol. – Cu. Ft.

Over 18" DIAM: No. – = Vol. – Cu. Ft.

SUMMARY

DEPTH 12.0 ft.

JAR SAMPLES –

BAG SAMPLES 1 Bag

GROUNDWATER –

TEST PIT NO. 84-5

H & A FORM 24 NOV. 78

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-6

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA
CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.
CONTRACTOR: MARCHESE & SONS, EVERETT, MA
EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 17±
EXPLORATION DATE: 4 Oct. 84
H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	1.2			Dark grayish brown silty medium to fine SAND, little coarse to fine gravel, trace coarse sand, cobbles, wood, loam, brick and bituminous pavement.	Concrete pile cap 4' X 5.5' X 2.5', 6" below ground surface inside of pit.
2	1.9			Yellow-brown coarse to fine SAND, little coarse to fine gravel, trace silt and small cobbles.	
	3.7			Tan-brown medium to fine SAND, trace coarse to fine gravel, coarse sand, silt and few small cobbles.	
4	5.1			Yellow-brown mottled silty CLAY, little sand, trace shells.	
6 8 10				Dark bluish gray very slightly organic silty CLAY, trace fine sand with black organic sandy silt pockets. (6"Ø black cast iron sewer pipe at 6.0 ft.)	See note TP 84-1 No water entering pit after 1 hr. Chemical samples obtained from adjacent test pit 84-6A at 2.5 ft.
12				Bottom of Exploration 12.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

12 (L) x 8 (W) x 12 (D) = 1152 Cu. Ft.

BOULDERS
8" to 18" DIAM: No. – Vol. – Cu. Ft.
Over 18" DIAM: No. – Vol. – Cu. Ft.

SUMMARY
DEPTH 12.0 ft.
JAR SAMPLES –
BAGSAMPLES –
GROUNDWATER –
TEST PIT NO. 84-6

H & A FOR. NOV. 78 24

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-7

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA
CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.
CONTRACTOR: MARCHESE & SONS, EVERETT, MA
EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 17±
EXPLORATION DATE: 4 Oct. 84
H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	0.2			Dark brown silty SAND, trace gravel, loam, roots, wood.	
	0.5			CONCRETE SLAB	
	1.5	B1	0.5 - 1.5	Black CINDERS, trace sand, gravel and brick.	
2	3.7			Yellow-brown rust-brown medium to fine SAND, trace coarse sand, silt with occasional small pockets of black cinders.	
4	5.5			Bluish gray clayey SILT, some fine sand.	
6 8 10 12				Dark bluish gray silty CLAY with very slightly organic silt pockets, trace sand and shells and pockets of medium to fine sand.	Soil wet at 5.0 ft. but no water entering pit. See note TP 84-1
				Bottom of Exploration 12.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		

NOT ENCOUNTERED X *HRS. AFTER COMPL.

10 (L) x 3 (W) x 12 (D) = 360 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – = Vol. – Cu. Ft.
Over 18" DIAM: No. – = Vol. – Cu. Ft.

SUMMARY

DEPTH 12.0 ft.
JAR SAMPLES –
BAGSAMPLES 1 Bag
GROUNDWATER –
TEST PIT NO. 84-7

H & A FOR. NOV. 78 24

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	# TEST PIT REPORT	TEST PIT NO. 84-8

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA

CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.

CONTRACTOR: MARCHESE & SONS, EVERETT, MA

EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556

LOCATION: See Plan

ELEVATION: 18.5±

EXPLORATION DATE: 4 Oct. 84

H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
				Dark brownish gray sandy SILT, little gravel, trace loam, brick. (cemented in-situ)	
	1.7				
2				Yellow-brown gravelly coarse to fine SAND, trace silt and few small cobbles.	
	3.0				
				Brown medium to fine SAND, little silt, trace coarse sand and coarse to fine gravel, small cobbles.	
4	4.0				
				Dark bluish gray very slightly organic clayey SILT to silty CLAY, trace fine sand and pockets of black organic silt.	
6					See note TP 84-1 Trapped water seeping in very slowly at 3.8 ft.
8					
10					
12					
				Bottom of Exploration 12.0 ft.	

H & A FOR 24
NOV. 78

GROUNDWATER		
DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED X	*	HRS. AFTER COMPL.

10 (L) x 4 (W) x 12 (D) = 480 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – = Vol. – Cu. Ft.

Over 18" DIAM: No. – = Vol. – Cu. Ft.

SUMMARY

DEPTH 12.0 ft.

JAR SAMPLES –

BAGSAMPLES –

GROUNDWATER –

TEST PIT NO. 84-8

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-9

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA
CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.
CONTRACTOR: MARCHESE & SONS, EVERETT, MA
EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 18.5±
EXPLORATION DATE: 4 Oct. 84
H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
		B1	0.0 to 1.9	Dark gray to dark brownish black silty SAND, little gravel, trace black cinders, wood, metal, loam, cobbles.	
2 4	1.9			Yellow-brown to gray-brown medium to fine SAND, trace coarse sand, coarse to fine gravel, silt and small cobbles.	
6 8	4.4			Bluish gray very slightly organic silty CLAY to clayey SILT, trace pockets, black organic silt.	See note TP 84-1 Trapped water entered pit very rapidly at 5.0 ft.
10 12				Bottom of Exploration 9.0 ft.	

GROUNDWATER		
DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

10 x 4 x 9 = 360 Cu. Ft.
(L) (W) (D)

BOULDERS

8" to 18" DIAM: No. – Vol. – Cu. Ft.
Over 18" DIAM: No. – Vol. – Cu. Ft.

SUMMARY

DEPTH 9.0 ft.
JAR SAMPLES –
BAGSAMPLES 1 Bag
GROUNDWATER –
TEST PIT NO. 84-9

H & A FOH. NOV. 78 24

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	# TEST PIT REPORT	TEST PIT NO. 84-10

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA

CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.

CONTRACTOR: MARCHESE & SONS, EVERETT, MA

EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556

LOCATION: See Plan

ELEVATION: 18±

EXPLORATION DATE: 4 Oct. 84

H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	1.1			Dark brown silty medium to fine SAND, little gravel, trace loam, brick, roots, metal, cobbles.	
	1.5			Brown medium to fine SAND, little silt, trace coarse sand and gravel.	
2	1.8			Black CINDERS.	
				Dark brown medium to fine SAND, little silt and coarse to fine gravel, trace coarse sand, cobbles and brick fragments.	
4	4.0			Yellow-gray silty CLAY, trace sand.	
	4.5			Oyster SHELLS in a slightly organic silt matrix.	
6					See note TP 84-1
					Pit excavated adjacent to granite block sea wall. Pit on slip side of wall.
8					No water entering pit after 1 hour.
10				Bottom of Exploration 10.0 ft. Unable to penetrate deeper. Pit caving in.	
12					

GROUNDWATER		
DATE	TIME*	DEPTH/FT
See Note		
NOT ENCOUNTERED X	*	HRS. AFTER COMPL.

15 (L) x 5 (W) x 10 (D) = 750 Cu. Ft.

BOUNDERS

8" to 18" DIAM: No. –	= Vol. –	Cu. Ft.
Over 18" DIAM: No. –	= Vol. –	Cu. Ft.

SUMMARY

DEPTH 10.0 ft.

JAR SAMPLES –

BAGSAMPLES –

GROUNDWATER –

TEST PIT NO. 84-10

H & A FORM NOV. 78 24

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-11

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA
CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.
CONTRACTOR: MARCHESE & SONS, EVERETT, MA
EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 18.5±
EXPLORATION DATE: 4 Oct. 84
H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
	0.2			CRUSHED STONE.	
	0.6			Brown silty SAND, little gravel, trace brick, loam.	
	1.1			Dark brown loamy SILT, some fine sand, trace gravel.	
2	2.0			Gray medium to fine SAND, little gravel and silt with pockets of dark brown loamy silt, brick.	
	3.1			Dark rust-brown coarse to fine SAND, little gravel and silt, small cobbles.	
4	3.8	B1	4.0 - 5.0	Dark gray medium to fine SAND, little silt, trace coarse sand.	Strong odor of petroleum from 3 ft. to 5 ft. depth.
	5.0			Dark bluish gray coarse to fine SAND, little silt and gravel, trace pockets of clay.	
6				Dark bluish gray silty CLAY to clayey SILT with lenses and pockets of silt, fine sand, trace black very slightly organic silt pockets, shells.	See note TP 84-1
8					No water entering pit after 1 hour. Obtained samples for chemical testing at 4.0 and 6.0 ft.
10				Bottom of Exploration 10.0 ft.	
12					

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		

NOT ENCOUNTERED X * HRS. AFTER COMPL.

12 (L) x 4 (W) x 10 (D) = 480 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – = Vol. – Cu. Ft.
Over 18" DIAM: No. – = Vol. – Cu. Ft.

SUMMARY

DEPTH 10.0 ft.
JAR SAMPLES –
BAGSAMPLES 1 Bag
GROUNDWATER –
TEST PIT NO. 84-11

H & A FOH NOV. 78 24

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-12

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA

CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.

CONTRACTOR: MARCHESE & SONS, EVERETT, MA

EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 18±
EXPLORATION DATE: 4 Oct. 84
H & A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
				Black BITUMINOUS PAVEMENT.	
	0.2			Yellow-brown gravelly coarse to fine SAND, trace shells and small cobbles.	
2	1.0			Dark brown loamy SILT, some sand, little gravel, brick, concrete, cobbles, small boulders.	
4	3.1			Greenish gray silty SAND, trace gravel, coarse sand, cobbles.	Obtained sample for chemical testing at 3.5 ft.
	4.2			Yellow-brown dark brown silty SAND, little gravel, trace brick and clay lumps.	See note TP 84-1
6	5.4			Refusal on concrete "box" structure. Unable to penetrate.	No water entering pit after 2 hours.
8					
10					
12					

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		

NOT ENCOUNTERED X * HRS. AFTER COMPL.

10 (L) x 4 (W) x 5.4 (D) = 216 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – = Vol. – Cu. Ft.
Over 18" DIAM: No. – = Vol. – Cu. Ft.

SUMMARY

DEPTH 5.4 ft.
JAR SAMPLES –
BAGSAMPLES –
GROUNDWATER –
TEST PIT NO. 84-12

H & A FORM NOV. 78 24

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST PIT REPORT

TEST PIT NO. 84-13

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA
CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.
CONTRACTOR: MARCHESE & SONS, EVERETT, MA
EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556
LOCATION: See Plan
ELEVATION: 19±
EXPLORATION DATE: 4 Oct. 84
H&A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
2				Dark brown loamy SAND, little silt, gravel, trace brick, metal, cobbles.	
	2.2			Dark brown-yellow brown silty SAND, trace gravel, clay, brick, metal, wood.	
	3.0			Very dark brown intermixed loamy SAND, some silt, little clay, trace gravel, brick, metal, cobbles and organic silt.	Obtained samples for chemical testing at 3.5 ft.
4	4.0			Yellow-brown bluish gray silty CLAY, some sand, trace gravel, brick, organic silt.	
	5.5			Dark brown loamy SILT, little brick and gravel.	
6 8	6.0			Yellow brown-gray silty CLAY, some sand.	
	8.5			Black silty SAND, some cinders (very slight petroleum odor).	See note TP 84-1
	9.0			Yellow-brown silty SAND, little clay, trace gravel, brick.	No water entering pit after 1 hour.
10	10.0			Dark brown clayey fine SAND, some silt, trace coarse to fine gravel, brick, wood, cobbles, concrete.	
12				Bottom of Exploration 12.0 ft.	

H & A FORM NOV. 78 24

GROUNDWATER

DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

10 (L) x 4 (W) x 12 (D) = 480 Cu. Ft.

BOULDERS
8" to 18" DIAM: No. – Vol. – Cu. Ft.
Over 18" DIAM: No. – Vol. – Cu. Ft.

SUMMARY
DEPTH 12.0 ft.
JAR SAMPLES –
BAGSAMPLES –
GROUNDWATER –
TEST PIT NO. 84-13

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	**TEST PIT REPORT**	TEST PIT NO. 84-14

PROJECT: PIERS 1, 2 & 3, NORTHERN AVE., BOSTON, MA

CLIENT: HBC ASSOCIATES C/O CARPENTER & CO. INC.

CONTRACTOR: MARCHESE & SONS, EVERETT, MA

EQUIPMENT USED: CASE 580D, 3/8 CU. YD. BACKHOE

FILE NO. 5556

LOCATION: See Plan

ELEVATION: 18±

EXPLORATION DATE: 4 Oct. 84

H & A REP.: J. Humphrey

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	DESCRIPTION OF MATERIALS	REMARKS
				Crushed STONE.	
	0.2			Dark brown silty SAND, little gravel, trace loam, brick, wood, metal, cobbles.	
	1.2			Very dark brown loamy SAND, some silt, trace coarse to fine gravel, wood, brick, metal.	
2					
	2.4			Yellow-brown medium to fine SAND, little silt and gravel, trace loam and wood.	
	2.9			COBBLESTONE ROADWAY.	
	3.4			Yellow-brown silty medium to fine SAND, trace coarse sand and gravel.	
4					
	4.8			Yellow-brown medium to fine SAND, little silt, trace coarse to fine gravel, small cobbles.	
	5.5				
6				Bluish gray clayey SILT, some fine sand with silt and fine sand layers and pockets, trace very slightly organic silt with shells.	Trapped water entered pit very slowly at 5.0 ft. See note TP 84-1
8					
10				Bottom of Exploration 10.0 ft.	
12					

GROUNDWATER		
DATE	TIME*	DEPTH/FT.
See Note		
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

10 (L) x 4 (W) x 10 (D) = 400 Cu. Ft.

BOULDERS

8" to 18" DIAM: No. – Vol. – Cu. Ft.

Over 18" DIAM: No. – Vol. – Cu. Ft.

SUMMARY

DEPTH 10.0 ft.

JAR SAMPLES –

BAGSAMPLES –

GROUNDWATER –

TEST PIT NO. 84-14

H & A FOH NOV. 78 24

Appendix C

APPENDIX C

Logs of Phase I Test Borings

Test Borings B101 To B129 and B312 to B314

DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS

SOIL

Soil descriptions noted on logs of subsurface explorations are based on Standard Penetration Test results, visual-manual examination of exposed soil and soil samples, and the results of laboratory testing on selected soil samples. The criteria, descriptive terms and definitions used are as follows:

TYPICAL DESCRIPTIONS

Loose brown medium to fine SAND, little silt, trace fine gravel - FILL -

Stiff gray silty CLAY, with frequent fine sand partings (CL/SM)

Very dense grey silty medium to fine SAND, little coarse sand, trace clay (SM) - GLACIAL TILL

DENSITY OR CONSISTENCY

Density of Cohesionless Soils	Penetration Resistance (Blows per foot)	Consistency of Cohesive Soils	Penetration Resistance (Blows per foot)
Very loose	0 - 4	Very soft	0 - 2
Loose	4 - 10	Soft	2 - 4
medium dense	10 - 30	Medium stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	over 50	Very stiff	15 - 30
		Hard	over 30

Penetration Resistance:

Standard Penetration Test (ASTM D-1586) - Number of blows required to drive a standard 2-inch outside diameter split spoon sampler 12 inches using a 140 pound weight falling freely through 30 inches.

COLOR

Black, brown, yellow-brown, gray, blue-gray, etc.

COMPONENT DEFINITIONS BY GRADATION

Material	Definitions	Fractions	Sieve Limit Upper	Sieve Limit Lower
Boulders	Material too large to pass through an opening 8 inches square.			
Cobbles	Material passing through an 8-in. square opening and retained on the 3-in. sieve.			
Gravel	material passing the 3-in. sieve and retained on the No. 4 sieve.	Coarse Fine	3-in. 3/4-in.	3/4-in. No. 4
Sand	Material passing the No. 4 sieve and retained on the No. 200 sieve.	Coarse Medium Fine	No. 4 No. 10 No. 40	No. 10 No. 40 No. 200
Silt	material passing the No. 200 sieve which is also non-plastic in character and exhibits little or no strength when dried.		No. 200	
Clay	Material passing the No. 200 sieve which can also be made to exhibit plasticity within a certain range of moisture contents and which exhibits considerable strength when air dried.		No. 200	

COMPONENT

major soil component = Upper case letters

Secondary component = Adjective used (if 20-50% of total)

Third component = "some" used (if third component comprises 20-35% of total)

Other components = "little" used (if 10-20% of total)
"trace" used (if 10% of total)

TERMINOLOGY RELATED TO STRATIFIED SOILS

Laminae - 0 to 1/16 inch thickness (cohesive soil)

Parting - 0 to 1/16 inch thickness (granular soil)

Seam - 1/16 to 1/2 inch thickness

Layer - 1/2 to 12 inch thickness

Stratum - Usually greater than 12 inch thickness; occasionally less

Pocket - Small, erratic deposit usually less than 12 inches

Lens - Lenticular deposit, larger than pocket

Occasional - One or less per foot of thickness

Frequent - More than one per foot of thickness

Interbedded - Applied to strata of soil lying between or alternately with other strata of a different nature.

OTHER DESCRIPTIVE TERMS

Geological classification - FILL, GLACIAL TILL

The naturally occurring soils are also classified by the criteria of the Unified Soil Classification System (USCS), with the appropriate group symbol indicated in parenthesis for each soil description (fill materials are not classified).

PP = Unconfined Compressive Strength, in TSF, measured using Soiltest Pocket Penetrometer.

TV = Undrained Shear Strength, in TSF, measured using Soiltest Torvane.

ROCK

Rock descriptions noted on logs of subsurface explorations are based on visual-manual examination of exposed rock and core samples. The criteria, descriptive terms and definitions used are as follows:

TYPICAL DESCRIPTION:

Hard, freshly weathered, Moderately fractured, gray, amorphous ARGILLITE; close, tight, moderately dipping, smooth or irregular joints; thin, shallow bedding; occasional pyrite and calcite fillings; occasional veins of sandstone.

FIELD HARDNESS: (A measure of resistance to scratching or abrasion.)

Very hard - Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick

Hard - Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.

Moderately hard - Can be scratched with knife or pick. Gouges or grooves to 1/4 inch deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.

medium - Can be grooved or gouged 1/16 inch deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1 inch maximum size by hard blows of the point of a geologist's pick.

Soft - Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by Moderate blows of a pick point. Small thin pieces can be broken by finger pressure.

Very soft - Can be carved with knife. Can be excavated readily with point of pick. Pieces 1 inch or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

WEATHERING: (The action of the elements in altering the color, texture and composition of the rock.)

Fresh - Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.

Very slight - Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.

Slight - Rock generally fresh, joints stained, and discoloration extends into rock up to 1 inch. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.

Moderate - Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.

Moderately severe - All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick. Rock goes "clunk" when struck.

Severe - All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.

Very severe - All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining

Complete - Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small scattered locations. Quartz may be present as dikes or stringers.

ROCK CONTINUITY: (Any break in a rock whether or not it has undergone relative displacement.)

Extremely Fractured - Drill core stem less than 1 inch.

Moderately Fractured - Drill core stem 1 in. to 4 inches.

Slightly Fractured - Drill core stem 4 inches to 8 inches

Sound - Drill core stem greater than 8 inches.

Note: Rock Continuity terms are generalized to describe the average condition of the rock obtained from the core run. Portions of the rock within the run described may vary from the generalized descriptions.

COLOR:

Grey, dark gray, light gray, greenish-gray, etc.

TEXTURE: (Terminology used to identify size, shape and arrangement of constituent elements.)

Amorphous - Too small to be seen with naked eye.

Fine Grained - Barely seen with naked eye.

Medium Grained - Barely seen with naked eye to 1/8 inch.

Coarse Grained - 1/8 inch to 1/4 inch.

Very Coarse Grained > 1/4 inch.

LITHOLOGY:

ARGILLITE, altered BASALT, altered ANDESITE, etc.

DISCONTINUITIES: (Surfaces representing breaks or fractures separating the rock mass into discrete units.)

Crack - A partial or incomplete fracture.

Joint - A simple fracture along which no shear displacement has occurred. May form joint sets.

Shear - A fracture along which differential movement has taken place parallel to the surface sufficient to produce slickensides, striations or polishing. May be accompanied by a zone of fractured rock up to a few inches wide.

Fault - A major fracture along which there has been appreciable displacement and accompanied by gouge and/or a severely fractured adjacent zone.

Shear or Fault Zone - A band or zone of parallel, closely spaced shears or faults.

FRACTURES, BEDDING AND FOLIATION

Fractures	Bedding and Foliation	Spacing[1]
Very close	Very thin	Less than 2 inches
Close	Thin	2 inches - 1 foot
Moderately close	Medium	1 foot - 3 feet
Wide	Thick	3 feet - 10 feet
Very Wide	Very Thick	More than 10 feet

NOTE: (1) - Refers to perpendicular distance between discontinuities.

ATTITUDE

Attitude	Angle
Horizontal	0° - 5°
Shallow or low angle	5° - 35°
Moderately dipping	35° - 55°
Steep or high angle	55° - 85°
Vertical	85° - 90°

OTHER CHARACTERISTICS

Cavities and Voids
Secondary mineralization
Terminology related to stratification -
Partings - 0 to 1/16 inch thickness

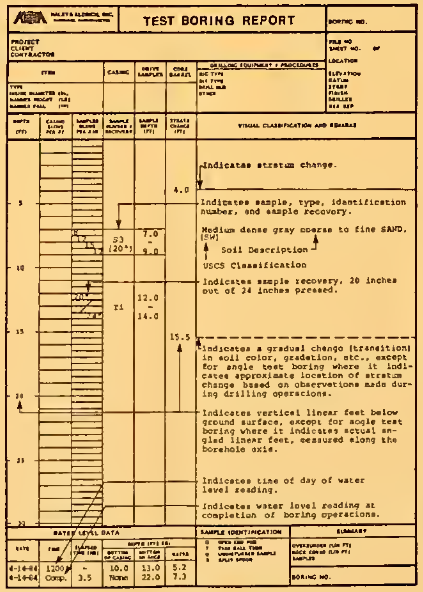
GENERAL NOTES

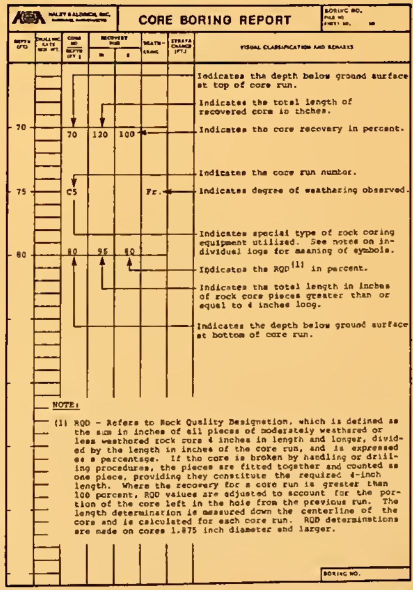
1. Logs of subsurface explorations depict subsurface soil, rock and water conditions only at the specific locations and on the dates indicated. Soil and rock conditions and water levels at other locations may differ from conditions and levels occurring at the subsurface exploration locations. Also, the passage of time may result in a change in the conditions and water levels at the subsurface exploration locations.

2. Water levels noted on the logs were monitored at the times and under the conditions indicated. In test borings, these water levels could have been affected by the introduction of water into the boring during drilling, extraction of tools, or other procedures and thus may not reflect the actual groundwater level at the test boring location. It should be noted that fluctuations in groundwater levels normally occur due to variations in precipitation, temperature, season, tidal fluctuation, adjacent construction activity and pumping of water supply wells and construction dewatering systems.

SPECIAL NOTES

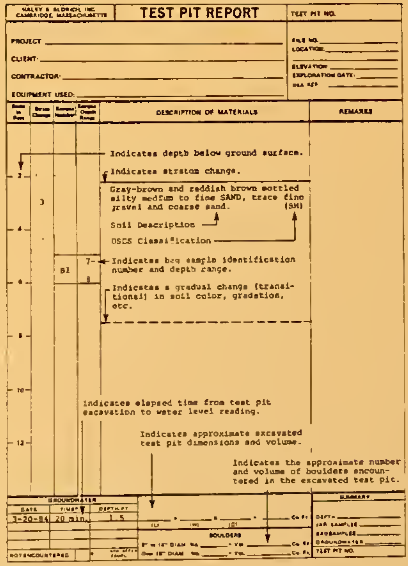
LEGEND FOR SUBSURFACE EXPLORATION LOGS


HALEY & ALDRICH, INC.
TEST BORING REPORT
BORING NO.
PROJECT
CLIENT
CONTRACTOR
FILE NO.
SHEET NO. OF
LOCATION
ELEVATION
DATUM
START
FINISH
DRILLER
H&A REP
ITEM
CASING
DRIVE SAMPLES
CORE BARREL
DRILLING EQUIPMENT & PROCEDURES
TYPE
INSIDE DIAMETER (IN)
HAMMER WEIGHT (LB)
HAMMER FALL (IN)
DEPTH (FT)
CASING BLOWS PER FT
SAMPLER BLOWS PER 6 IN
SAMPLE NUMBER & RECOVERY
SAMPLE DEPTH (FT)
STRATA CHANGE (FT)
VISUAL CLASSIFICATION AND REMARKS
5
10
15
20
25
30
4.0
S3 (20")
7.0 - 9.0
T1
12.0 - 14.0
15.5
Indicates stratum change.
Indicates sample, type, identification number, and sample recovery.
Medium dense gray coarse to fine SAND, (SW)
Soil Description
USCS Classification
Indicates sample recovery, 20 inches out of 24 inches pressed.
Indicates a gradual change (transition) in soil color, gradation, etc., except for angle test boring where it indicates approximate location of stratum change based on observations made during drilling operations.
Indicates vertical linear feet below ground surface, except for angle test boring where it indicates actual angled linear feet, measured along the borehole axis.
Indicates time of day of water level reading.
Indicates water level reading at completion of boring operations.
WATER LEVEL DATA
DATE
TIME
ELAPSED TIME (HR)
DEPTH (FT) TO:
BOTTOM OF CASING
BOTTOM OF HOLE
WATER
4-14-84
1200
-
10.0
13.0
5.2
4-14-84
Comp.
3.5
None
22.0
7.3
SAMPLE IDENTIFICATION
SUMMARY
OVERBURDEN (LIN FT)
ROCK CORED (LIN FT)
SAMPLES
BORING NO.


HALEY & ALDRICH, INC.
CORE BORING REPORT
BORING NO.
FILE NO.
SHEET NO.
DEPTH (FT)
DRILLING RATE MIN/FT
CORE NO. DEPTH (FT)
RECOVERY RQD
WEATHERING
STRATA CHANGE (FT)
VISUAL CLASSIFICATION AND REMARKS
70
75
80
70
120
100
C5
Fr.
80
96
80
Indicates the depth below ground surface at top of core run.
Indicates the total length of recovered core in inches.
Indicates the core recovery in percent.
Indicates the core run number.
Indicates degree of weathering observed.
Indicates special type of rock coring equipment utilized. See notes on individual logs for meaning of symbols.
Indicates the RQD(1) in percent.
Indicates the total length in inches of rock core pieces greater than or equal to 4 inches long.
Indicates the depth below ground surface at bottom of core run.
BORING NO.

NOTE:

(1) RQD - Refers to Rock Quality Designation, which is defined as the sum in inches of all pieces of moderately weathered or less weathered rock core 4 inches in length and longer, divided by the length in inches of the core run, and is expressed as a percentage. If the core is broken by handling or drilling procedures, the pieces are fitted together and counted as one piece, providing they constitute the required 4-inch length. Where the recovery for a core run is greater than 100 percent, RQD values are adjusted to account for the portion of the core left in the hole from the previous run. The length determination is measured down the centerline of the core and is calculated for each core run. RQD determinations are made on cores 1.875 inch diameter and larger.


HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS
TEST PIT REPORT
TEST PIT NO.
PROJECT
CLIENT
CONTRACTOR
EQUIPMENT USED
FILE NO.
LOCATION
ELEVATION
EXPLORATION DATE
H&A REP
DESCRIPTION OF MATERIALS
REMARKS
2
3
4
6
8
10
12
B1
7-8
Indicates depth below ground surface.
Indicates stratum change.
Gray-brown and reddish brown mottled silty medium to fine SAND, trace fine gravel and coarse sand. (SM)
Soil Description
USCS Classification
Indicates bag sample identification number and depth range.
Indicates a gradual change (transitional) in soil color, gradation, etc.
Indicates elapsed time from test pit excavation to water level reading.
Indicates approximate excavated test pit dimensions and volume.
Indicates the approximate number and volume of boulders encountered in the excavated test pit.
GROUNDWATER
DATE
TIME
DEPTH
3-20-84
20 min.
1.5
NOT ENCOUNTERED
BOULDERS
SUMMARY
TEST PIT NO.

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS
CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS AND HYDROGEOLOGISTS

HBC ASSOCIATES
FAN PIER DEVELOPMENT
SOUTH BOSTON, MASSACHUSETTS

DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS

SCALE: NONE

MARCH 1988

FIGURE C-1

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B101

PROJECT	BOSTON FAN PIER, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	17.2
DATUM	Boston City Base
START	4 Nov. 1985
FINISH	15 Nov. 1985
DRILLER	M. Fisher
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/BW	S	BX
INSIDE DIAMETER (IN)	4/2½	1-3/8	1-5/8
HAMMER WEIGHT (LB)	300	140	--
HAMMER FALL (IN)	24	30	--

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig
BIT TYPE	Roller Bit
DRILL MUD	---
OTHER	Advanced HW casing to 30.0 ft, Went open hole to 110.0 ft, Telescoped BW casing to 134.0 ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	21	28 28 18	S1 (10)	0.0 - 1.5		Dense yellow-brown/black coarse to fine sandy GRAVEL, trace silt
	58					
	33					- FILL -
	19					
	23					
5	11	2 1 2	S2 (4)	5.0 - 6.5		Very loose brown coarse to fine sandy GRAVEL, trace silt
	4					
	5					- FILL -
	8					
	6				10.0	
10	8	2 1 2	S3 (18)	10.0 - 11.5		Soft, gray-blue clayey SILT, little fine sand, trace peat fibers
	11					
	12					- FILL -
	14					
	13					
15	16	2 4 5	S4 (12)	15.0 - 16.5		Stiff mottled yellow silty CLAY with frequent pockets of black organic silt, little fine sand
	18					
	21					- FILL -
	23					
	24				19.5	
20	30	2 2 3	S5 (14)	19.5 - 21.0		Loose gray organic silty fine SAND, trace shells, wood (SM-OL)
	32					
	34					
	36				24.5	
25	24/6"	1 2 2	S6 (6)	24.5 - 26.0		Soft to medium stiff brown FIBROUS PEAT, with 2-inch layer of gray fine sand, trace shells at top of sample (Pt)
					29.5	
30		5	S7 (18)	29.5 - 31.0		

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
15 Nov 1985	Installed Observation Well				

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
C	Core Run
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	136.0 ft
ROCK CORED (LIN FT)	10.0 ft
SAMPLES	28S, 3C

BORING NO. B101

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B101
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		9 12	S7(cont) (18)	29.5- 31.0		Very stiff mottled yellow brown silty CLAY with frequent pockets, seams and partings of silty fine sand and silt (CL)
					34.0	--
35		11 15 18	S8 (10)	34.5- 36.0		Dense yellow-brown silty fine SAND, little gravel, frequent laminae and seams of fine sandy silt (SM)
					38.0	--
40		3 3 4	S9 (18)	40.0 - 41.5		Medium stiff gray-brown silty CLAY interbedded with fine sand (CL-SP)
45		3 3 5	S10 (18)	45.0 46.5		Medium stiff to stiff gray-brown silty CLAY with frequent partings and seams of fine sand (CL)
50		2 2 3	S11 (18)	50.0 - 51.5		Medium stiff gray silty CLAY, with occasional fine sand partings (CL)
55		2 4 5	S12 (18)	55.0 - 56.5		Medium stiff gray silty CLAY with frequent fine sand partings (CL)
60		4 5 6	S13 (18)	60.0 - 61.5		Stiff gray silty CLAY with occasional fine sand partings (CL)
65		3 4 5	S14 (18)	65.0 - 66.5		Stiff gray silty CLAY (CL)
70						

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	TEST BORING REPORT	BORING NO. B101 FILE NO. 5556 SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		3 4 4	S15 (18)	70.0 - 71.5		Medium stiff to stiff gray silty CLAY (CL)
75		3 3 3	S16 (18)	75.0 - 76.5		Medium stiff gray silty CLAY (CL)
80		1 3 5	S17 (18)	80.0 - 81.5		Medium stiff to stiff gray silty CLAY (CL)
85		WOR/ /12" 1	S18 (18)	85.0 - 86.5		Very soft gray silty CLAY (CL)
90		WOR/ /12" 1	S19 (18)	90.0 - 91.5		Very soft gray silty CLAY (CL)
95		WOR/ 12" 1	S20 (18)	95.0 - 96.5		Very soft gray silty CLAY (CL)
100		WOR/ 18"	S21 (18)	100.0 - 101.5		Very soft gray silty CLAY (CL)
105		WOR 2 3	S22 (18)	105.0 - 106.5		Medium stiff gray silty CLAY (CL)
110						

BORING NO. B101

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B101
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		2 4 4	S23 (18)	110.0 - 111.5		Medium stiff gray silty CLAY with frequent sand partings (CL)
					112.5	
115		19 19 28	S24 (12)	115.0 - 116.5		Dense gray silty medium to fine SAND, little gravel, trace coarse sand (well bonded in-situ) (SM) - GLACIAL TILL -
120		20 24 27	S25 (8)	120.0 - 121.5		Very dense gray silty coarse to fine SAND, little gravel (well bonded in-situ) (SM) - GLACIAL TILL -
125		35 29 59	S26 (1)	125.0 - 126.5		Very dense gray fine sandy SILT, little coarse sand, trace gravel - GLACIAL TILL -
			C	127.0 - 128.0		(Cored boulder 127.0 to 128.0 ft) (ML-SM)
130		*147 *120/0	S27 (4)	129.5 - 130.0		Very dense gray clayey SILT, trace medium to fine sand (MH) - GLACIAL TILL -
					134.0	
135		*95 120/1'	S28 (7)	135.0 - 135.6	136.0	Gray, completely weathered ARGILLITE. (Hard gray clayey SILT)
						(NOTE: See Core Boring Report, page 5) * Indicates split spoon driven with 300-pound hammer falling 24-inches
140						
145						
						Bottom of Exploration at 146.0 ft.
150						

BORING NO. B101

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B101
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY IN.	RQD %	WEATH-ERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						136.0	
	8	136.0 C1 137.0	--	--	--		NO RECOVERY (Core barrel jammed)
	8	137.0	14	29			Medium to soft, moderately weathered, moderately fractured gray, aphanitic ARGILLITE; very thin, vertical (85 - 90) bedding.
	8	C2			MODER-ATE		
	8						
140	8	141.0	0	0			
	8	141.0	24	40			Medium to soft, moderately weathered, extremely to moderately fractured, gray, aphanitic, ARGILLITE; very close, tight to open, horizontal (0° - 5°) [occasional steeply dipping (55°- 85°), smooth to rough joints; very thin, high angle (55°- 85°) to vertical (85°- 90°) bedding, with seams and layers of very severely weathered ARGILLITE (gray clayey SILT).
	9						
	5	C3			MODER-ATE		
	5						
145	5	146.0	0	0			

Bottom of Exploration at 146.0 ft

NOTE: Observation well installed in completed borehole. Refer to installation report for details

150

BORING NO. B101

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B102

PROJECT	BOSTON FAN PIER, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc. E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	16.2
DATUM	Boston City Base
START	31 Oct. 1985
FINISH	6 Nov. 1985
DRILLER	G. Brouillette
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW	S	NXD3
INSIDE DIAMETER (IN)	4	1-3/8	2-1/8
HAMMER WEIGHT (LB)	Drilled	140	Split-inner
HAMMER FALL (IN)	in	30	Barrel

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck mounted CME 75
BIT TYPE	Roller Bit
DRILL MUD	--
OTHER	Spun NW casing to 34.0ft Telescoped NW casing to 144.0 ft Cored 144.0 to 164.0 ft

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		10 15 16 17	S1 (8)	0.0- 2.0		Dense brown silty medium to fine SAND, little coarse sand, trace gravel, wood
						- FILL -
5	30 35	3 17 19 17	NR	4.0- 6.0		No Recovery (made 2 attempts)
	18 15 13					
10		2 2 2 2	S2 (12)	9.0- 11.0		Soft to medium stiff gray silty CLAY with layers of fine sand
						- FILL -
15		2 3 2 3	S3 (12)	14.0- 16.0		Medium stiff black ORGANIC SILT, little fine sand
						- FILL -
20		2 3 2 2	S4 (24)	19.0- 21.0		Medium stiff gray silty CLAY, trace shells with frequent pockets of fine sand and black organic silt
						- FILL -
					24.0	
25		8 5 5 8	S5 (24)	24.0- 26.0		Stiff gray silty CLAY, with occasional fine sand partings (CL)
30		8 8	S6 (18)	29.0- 31.0		Stiff to very stiff gray silty CLAY (CL)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	144.0 ft
ROCK CORED (LIN FT)	20.0 ft
SAMPLES	27S, 4C

BORING NO. B102

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. 8102
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		8 7	S6 (18)	29.0- 31.0		Stiff to very stiff gray silty CLAY (CL)
35		5 4 5 5	S7 (24)	34.0- 36.0		Stiff gray silty CLAY with occasional fine sand partings (CL)
40		9 15 14 12	S8 (6)	39.0- 41.0	39.5 41.0	Medium dense gray silty fine SAND (SM)
45		2 3 4 4	S9 (24)	44.0- 46.0		Medium stiff gray silty CLAY with frequent fine sand partings and seams (CL)
50		2 2 4 4	S10 (24)	49.0- 51.0		Medium stiff gray silty CLAY (CL)
55		1 1 2 4	S11 (24)	54.0- 56.0		Soft gray silty CLAY (CL)
60		2 2 2 4	S12 (24)	59.0- 61.0		Soft to medium stiff gray silty CLAY with occasional fine sand partings (CL)
65		2 2 3 4	S13 (24)	64.0- 66.0		Medium stiff gray silty CLAY (CL)
70		1 1	S14 (24)	69.0- 71.0		Soft gray silty CLAY (CL)

BORING NO. B102

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B102
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		2 3	S14 (24)	69.0- 71.0		Soft gray silty CLAY (CL)
75		1 1 2 3	S15 (24)	74.0- 76.0		Soft gray silty CLAY (CL)
80		WOR/ 12" 3 6	S16 (24)	79.0- 81.0		Soft gray silty CLAY (CL)
85		1 2 2 3	S17 (24)	84.0- 86.0		Soft to medium stiff gray silty CLAY (CL)
90		WOR/ 24"	S18 (24)	89.0- 91.0		Very soft gray silty CLAY (CL)
95		WOR/ 24"	S19 (24)	94.0- 96.0		Very soft gray silty CLAY (CL)
100		WOR/ 24"	S20 (24)	99.0- 101.0		Very soft gray silty CLAY (CL)
105		WOR/ 24"	S21 (24)	104.0- 106.0		Very soft gray silty CLAY (CL)
110		WOR/ 24"	S22 (24)	109.0- 111.0		Very soft gray silty CLAY (CL)

TEST BORING REPORT

BORING NO. B102
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		WOR/ 24"	S22 (24)	109.0- 111.0		Very soft gray silty CLAY (CL)
		WOR/ 24"	S23 (24)	114.0- 116.0		Very soft gray silty CLAY (CL)
115						
		WOR/ 24"	S24 (24)	119.0- 121.0		Very soft gray silty CLAY with occasional fine sand partings (CL)
120						
					122.0	
		37 108	S25 (1)	124.0- 125.0		Very dense gray medium to fine sandy GRAVEL, some silt, trace coarse sand (GM) - GLACIAL OUTWASH -
125						
					128.0	
		62 69 70	S26 (6)	129.0 130.5		Very gray medium to fine sandy SILT, little coarse sand, gravel (very well bonded in-situ) (ML-SM) - GLACIAL TILL -
130						
		107	NR	134.0- 134.5		No Recovery
135						
					138.0	Gray completely weathered ARGILLITE
		100/2"	S27 (2)	139.0- 139.2		
140						
					143.5	(NOTE: See Core Boring Report, Page 5)
145						
150						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B102
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY RQD IN.	%	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						143.5	--
145	6 5 4 4 4	144.0 C1 149.0	42 13	70 22	SLIGHT to MODERATE		Medium to soft, slightly to moderately weathered, extremely to moderately fractured, gray, aphanitic ARGILLITE; very close, healed to open, steeply dipping (55°-85°) to vertical, smooth to rough joints; very thin, high angle (55°-85°) bedding.
150	4 4 4 2 3	149.0 C2 154.0	34 0	57 0	SLIGHT to MODERATE		Medium to soft, slightly to moderately weathered, extremely fractured, gray, aphanitic ARGILLITE; very close, tight to open, steeply dipping (55°- 85°) smooth to rough joints; very thin, high angle (55°- 85°) bedding.
155	4 4 4 4 4	154.0 C3 159.0	40 0	67 0	SLIGHT to MODERATE		Medium to soft (occasional zones very soft) slightly to moderately weathered (occasional zones are completely weathered) extremely to moderately fractured, gray, aphanitic ARGILLITE; very close to close, tight to open, steeply dipping (55°- 85°) (occasional horizontal joints) smooth to rough joints; very thin, high angle (55°- 85°) bedding, with frequent calcite veins.
160	6 6 6 6 6	159.0 C4 164.0	42 16	70 27	SLIGHT		Medium, slightly weathered, extremely to slightly fractured, gray, aphanitic ARGILLITE; very close to close, tight to open, steeply dipping (55°- 85°) [occasionally vertical], smooth to rough joints [NOTE: Presence of previous joints that have "healed"]; very thin, high angle (55°- 85°) bedding.
165							Bottom of Exploration at 164.0 ft

BORING NO. B102

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	# TEST BORING REPORT	**BORING NO.** B103

PROJECT	BOSTON FAN PIER, Boston, Massachusetts	**FILE NO.**	5556
CLIENT	HBC Associates, Boston, Massachusetts	**SHEET NO.**	1 OF 6
CONTRACTOR	Guild Drilling Co., Inc. E. Providence, Rhode Island	**LOCATION**	See Plan

ITEM	CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES			
				RIG TYPE	Truck Mounted CME 75	ELEVATION	16.0
				BIT TYPE	Roller Bit	DATUM	Boston City Base
TYPE	HW	S	NXD3	DRILL MUD	--	START	25 Oct 1985
INSIDE DIAMETER (IN)	4	1-3/8	2-1/8	OTHER	HW casing to 29.0 ft;	FINISH	31 Oct 1985
HAMMER WEIGHT (LB)	Drilled	140	Split-		went open hole 29.0 to 129.0 ft;	DRILLER	G. Brouillette
HAMMER FALL (IN)	in	30	inner Barrel		Telescoped NW casing to 144.5ft	H&A REP	T.M. Cormican

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		15 29 29 15	S1 (18)	0.0 - 2.0		Very dense black/yellow-brown silty fine SAND intermixed with ASH/CINDERS; little medium sand, trace coarse sand - FILL -
5		14 15 19 20	S2 (12)	4.0 - 6.0		Dense gray/yellow-brown silty fine SAND, little medium sand, trace coarse sand, gravel - FILL -
					9.0	
10		2 2 3 3	S3 (16)	9.0 - 11.0		Loose gray organic silty fine SAND, trace peat fibers and shells, frequent pockets of organic silt - FILL -
15		1 1 1 1	S4 (24)	14.0 - 16.0		Very soft black silty fine SAND with pockets of gray silty clay. - FILL -
					18.0	
20		2 2 3 4	S5 (24)	19.0 - 21.0		Medium stiff gray-black fine sandy ORGANIC SILT with occasional fine sand partings (OL-SP)
					22.0	
	82 60					
25	51 74	15 14 16 21	S6 (18)	24.0 - 26.0		Medium dense to dense stratified yellow-brown medium to fine SAND and gray silty fine sand (SP-SM)
	79 78				28.0	
	73					
30		5 5	S7 (24)	29.0 - 31.0		Stiff gray silty CLAY with frequent partings and seams of silty fine sand and silt (CL)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	154.1 ft
ROCK CORED (LIN FT)	10.0 ft
SAMPLES	32S, 2C

BORING NO. B103

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B103
FILE NO. 5556
SHEET NO. 2 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		6 6	S7 (24)	29.0- 31.0		Stiff gray silty CLAY with frequent partings and seams of silty fine sand and silt (CL)
35		2 4 4 4	S8 (24)	34.0 - 36.0		Medium stiff to stiff gray silty CLAY with frequent fine sand partings (CL)
40		2 4 4 4	S9 (24)	39.0- 41.0		Medium stiff to stiff gray silty CLAY with frequent fine sand partings (CL)
45		2 3 4 4	S10 (24)	44.0 - 46.0		Medium stiff gray silty CLAY with frequent fine sand partings and occasional silty fine sand seams (CL)
50		2 5 5 6	S11 (24)	49.0 - 51.0		Stiff gray silty CLAY with frequent fine sand partings (CL)
55		3 5 6 9	S12 (24)	54.0 - 56.0		Stiff gray silty CLAY with occasional medium to fine sand seams (CL)
60		3 4 6 7	S13 (24)	59.0 - 61.0		Stiff gray silty CLAY with frequent fine sand partings (CL)
65		2 3 4 8	S14 (24)	64.0 - 66.0		Medium stiff gray silty CLAY (CL)
70		WOR 3	S15 (24)	69.0 - 71.0		Medium stiff to stiff gray silty CLAY (CL)

BORING NO. B103

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B103
FILE NO. 5556
SHEET NO. 3 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		5 8	S15 (24)	69.0-71.0		Medium stiff to stiff gray silty CLAY (CL)
75		WOR/ /12" 4 5	S16 (24)	74.0-76.0		Soft to medium stiff gray silty CLAY (CL)
80		WOR/ /18" 6	S17 (24)	79.0-81.0		Very soft gray silty CLAY with occasional medium to fine sand seams (CL)
85		WOR/ /12" 7 6	S18 (24)	84.0-86.0		Medium stiff gray silty CLAY (CL)
90		WOR 2 5 7	S19 (24)	89.0-91.0		Medium stiff gray silty CLAY (CL)
95		WOR/ /18" 6	S20 (24)	94.0-96.0		Very soft gray silty CLAY (CL)
100		WOR/ 24"	S21 (24)	99.0-101.0		Very soft gray silty CLAY (CL)
105		WOR/ 24"	S22 (24)	104.0-106.0		Very soft gray silty CLAY (CL)
110		WOR/ 24"	S23 (24)	109.0-111.0		Very soft gray silty CLAY (CL)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B103
FILE NO. 5556
SHEET NO. 4 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		WOR/ 24"	S23 (24)	109.0 - 111.0		Very soft gray silty CLAY (CL)
115		WOR / 24"	S24 (24)	114.0 - 116.0		Very soft gray silty CLAY (CL)
120		WOR/ 24"	S25 (24)	119.0 - 121.0		Very soft gray silty CLAY (CL)
125		WOR/ 24"	S26 (24)	124.0 - 126.0		Very soft gray silty CLAY (CL)
		WOR	S27 (6)	129.0	129.5	Very soft gray silty CLAY (CL)
130		20 20 20	S27B (6)	129.5- 131.0		Dense gray clayey medium to fine SAND, little silt, trace coarse sand, gravel (SC)
					132.8	
135		79 98 40 53	S28 (3)	134.0 - 136.0		Very dense gray sandy GRAVEL (Argillite fragments) (GP) - GLACIAL TILL -
140		74 51 79	S29 (6)	139.0 - 140.5		Very dense gray coarse to fine sandy GRAVEL, little silt, (bonded in-situ) (GM) - GLACIAL TILL -
145		120	S30 (6)	144.5		Very dense gray silty medium to fine SAND, little coarse sand, trace gravel, (very well bonded in-situ) (SM) - GLACIAL TILL -
					147.0	
150		100/1"	S31 (1)	149.1		Gray very severely weathered ARGILLITE. (Hard gray clayey SILT, little gravel)

BORING NO. B103

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B103
FILE NO. 5556
SHEET NO. 5 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
150						
					154.0	
		100/0"	NR	154.1		No Recovery
155						NOTE: See Core Boring Report, page 6
160						
						Bottom of Exploration at 164.1 ft.
165						

BORING NO. B103

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO.	B103
FILE NO.	5556
SHEET NO.	6 OF 6

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						154.0	
	5	154.1	48	80			
155	5				VERY SLIGHT to SLIGHT		Moderately hard to medium, very slightly to slightly weathered, slightly fractured to sound (except extremely fractured from 155.7 to 155.8 ft), gray, aphanitic ARGILLACEOUS SANDSTONE; close, open to tight, steeply dipping (55°- 85°), smooth to rough joints; minor shears perpendicular to bedding from 154.1 to 156.0 ft; very thin high angle (55°- 85°) bedding [NOTE: Presence of former fractures that have been "healed".]
	5	C1					
	6						
	6	159.1	44	73			
	6	159.1	45	75			
160	6				VERY SLIGHT to SLIGHT		Medium, very slightly to slightly weathered, moderately fractured to sound, gray aphanitic ARGILLACEOUS SANDSTONE; close, open to tight, steeply dipping (55°- 85°), smooth to rough joints; very thin, steeply dipping (55°- 85°) bedding. [NOTE: Presence of former fractures that have "healed".]
	6	C2					
	6						
	6	164.1	30	50			
165							Bottom of Exploration at 164.1 ft

BORING NO. B103

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B104

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 6
LOCATION	See Plan
ELEVATION	16.4
DATUM	Boston City Base
START	18 Oct 1985
FINISH	24 Oct 1985
DRILLER	G. BROUILETTE
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NXD3
INSIDE DIAMETER (IN)	4/3	1-3/8	2-1/8
HAMMER WEIGHT (LB)	Drilled	140	Split-
HAMMER FALL (IN)	in	30	Barrel

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck mounted CME-75
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	Drilled casing to 29.0 ft, Drove HW casing 29.0 to 34.0 ft, Telescoped NW casing to 159.0 ft

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.2	ASPHALT
		40 100	S1 (12)	0.5 - 1.5		Very dense brown medium to fine SAND, little gravel, trace silt, coarse sand, red brick - FILL -
5		16 16 21 29	S2 (18)	4.0 - 6.0		Dense gray silty fine SAND, trace red brick, medium sand - FILL -
10		10 6 6 10	S3 (2)	9.0 - 11.0		Medium dense gray silty fine SAND, little red brick, trace medium sand, clay - FILL -
15		4 12 7 2	S4 (2)	14.0 - 16.0		Medium dense GRAVEL intermixed with CONCRETE, little coarse to fine sand, trace wood - FILL -
20		9 5 10 6	S5 (3)	19.0 - 21.0		Medium dense WOOD - FILL -
25		13 14 23 25	S6 (6)	24.0 - 26.0		Dense gray coarse to fine SAND, trace red brick - FILL -
30	30	9 9	S7 (9)	29.0 - 31.0		Medium dense gray-black silty fine SAND, little red brick, trace coarse to medium sand, gravel

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
Installed Observation Well					

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	159.1 ft
ROCK CORED (LIN FT)	20.0 ft
SAMPLES	33S, 8U, 3T

BORING NO. B104

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B104
FILE NO. 5556
SHEET NO. 2 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	50	9 10	S7 (9)	29.0- 31.0		Medium dense gray-black silty fine SAND, little red brick, trace coarse to medium sand, gravel
	51					
	55					- FILL -
	64					
35		9 9 10 10	S8 (10)	34.0 - 36.0		Medium dense gray silty fine SAND, trace coarse to medium sand and red brick with pockets of gray silty clay and organic silt - FILL -
40		6 6 9 9	S9 (8)	39.0 - 41.0		Medium dense yellow silty fine SAND, little coarse to fine sand, gravel, trace red brick
						- FILL -
45		9 13 10 14	S10 (12)	44.0 - 46.0		Medium dense, gray-black fine SAND, little silt, trace gravel - FILL -
					49.0	
50		6 4 4 6	S11 (15)	49.0 - 51.0		Loose black organic silty fine SAND to fine sandy ORGANIC SILT (OL-SM) - INTERMIXED FILL and ORGANIC SILT -
					53.0	
55		3 4 5 7	S12 (24)	54.0 - 56.0		Stiff gray silty CLAY, with occasional fine sand partings (CL)
		P U S H	T1 (16)	56.0 - 58.0		
60		1 2 3 4	S13 (12)	59.0 - 61.0		Medium stiff, gray silty CLAY (CL)
		P U S H	U1 (24)	61.0 - 63.0		
65		2 4 4 4	S14 (24)	64.0 - 66.0		Medium stiff to stiff, gray silty CLAY (CL)
70		P U	U2 (24)	69.0 - 71.0		

BORING NO. B104

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B104
FILE NO. 5556
SHEET NO. 3 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		S H	U2 (24)	69.0- 71.0		
		WOR 6 8 8	S15 (24)	71.0 - 73.0		Stiff gray silty CLAY, with occasional fine sand partings (CL)
75		WOR/ 12" 5 5	S16 (24)	74.0 - 76.0		Medium stiff gray silty CLAY (CL)
80		P U S H	U3 (24)	79.0 - 81.0		
		WOR/ 12" 2 7	S17 (24)	81.0 - 83.0		Very soft to soft gray silty CLAY, with occasional medium to fine sand seams (CL)
85		P U S H	T2 (24)	84.0 - 86.0		
		WOR/ 18" 1	S18 (24)	86.0 - 88.0		Very soft gray silty CLAY (CL)
90		P U S H	U4 (24)	89.0 - 91.0		
		WOR/ 12" 2 5	S19 (24)	91.0 - 93.0		Very soft to soft gray silty CLAY (CL)
95		WOR/ 24"	S20 (24)	94.0 - 96.0		Very soft gray silty CLAY (CL)
100		P U S H	U5 (24)	99.0 - 101.0		
		WOR/ 12" 3 5	S21 (24)	101.0 - 103.0		Soft gray silty CLAY (CL)
105		WOR/ 24"	S22 (24)	104.0 - 106.0		Very soft gray silty CLAY (CL)
110		P U	U6 (24)	109.0 - 111.0		

BORING NO. B104

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B104
FILE NO. 5556
SHEET NO. 4 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		S H	U6 (24)	- 111.0		
		WOR/ 24"	S23 (24)	111.0 - 113.0		Very soft gray silty CLAY (CL)
115		P U S H	T3 (24)	114.0 - 116.0		
		WOR/ 24"	S24 (24)	116.0 - 118.0		Very soft gray silty CLAY (CL)
120		P U S H	U7 (24)	119.0 - 121.0		
		WOR/ 24"	S25 (24)	121.0 - 123.0		Very soft gray silty CLAY (CL)
125		WOR/ 24"	S26 (24)	124.0 - 126.0		Very soft gray silty CLAY (CL)
130		P U S H	U8 (24)	129.0 - 131.0		
		WOR/ 24"	S27 (24)	131.0 - 133.0		Very soft gray silty CLAY (CL)
135		WOR/ 24"	S28 (24)	134.0 - 136.0		Very soft gray silty CLAY (CL)
140		WOR/ 12" 4	S29 (18)	139.0 - 140.5	140.5	Soft to medium stiff gray silty CLAY (CL)
		20	S29B(6)	141.0		Medium dense gray silty CLAY, little medium to fine sand, trace coarse sand (well bonded in-situ) (CL-SC)
145		14 13 25	S30 (4)	144.0 - 145.5		Dense gray gravelly medium to fine SAND, some silt, trace coarse sand, clay (well bonded in-situ) (SM) - GLACIAL TILL - NOTE: (Roller bit through 2-foot boulder 147.0 ft - 149.0 ft)
150		58 35 26	S31 (1)	149.0 - 150.5		Very dense gray gravelly coarse to fine SAND, little silt (well bonded in-situ)

BORING NO. B104

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B104
FILE NO. 5556
SHEET NO 5 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
150		26	S31(1)	-150.5		Very dense gravelly SAND, little silt with dobbles and boulders (SM) - GLACIAL TILL -
		25 34 27	NR	154.0 - 155.5		(No Recovery)
155						NOTE: (Boulder 155.5 ft - 157.0 ft)
					157.5	
		100/1"	S32 (1)	159.1	159.1	Gray ARGILLITE
160						(NOTE: See CORE BORING REPORT, Page 6)
165						
170						
175						
180						Bottom of Exploration at 179.1 ft.

BORING NO. B104

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B104
FILE NO. 5556
SHEET NO. 6 OF 6

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO.	RECOVERY RQD		WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
		DEPTH (FT.)	IN.	%			
	4	159.1	60	100		159.1	Soft, slightly weathered, slightly fractured to sound (except extremely from 163.2 ft - 164.1 ft), gray, aphanitic ARGILLITE; very close to moderately close, tight to open, steeply dipping (55° - 85°) [vertical at 163.8 ft], smooth to rough joints; minor sheer perpendicular to bedding at 160.0 ft, 161.1 ft and 162.2 ft - 162.7 ft; very thin, high angle (55 - 85) bedding; former joints that have been "healed" also present
160	5						
	6	C 1			SLIGHT		
	6						
	6	164.1	36	60			
165	6	164.1	39	65			Very soft to soft, slightly weathered, extremely to moderately fractured, gray aphanitic, fine sandy, ARGILLITE, very close to close, tight to open, steeply dipping (55°-85°) [vertical at 171.6 ft], smooth to rough joints; very thin, high angle (55°-85°) bedding with vertical calcite vein 169.1 ft - 169.9 ft NOTE: Last 3 inches of core run weathered to clay.
	6						
	6	C 2			SLIGHT		
	6						
	6	169.1	6	10			
	3	169.1	40	66			Very soft, slightly to moderately weathered, extremely to moderately fractured, gray aphanitic, fine sandy, ARGILLITE; very close to close, tight to open, steeply dipping (55°-85°) [occasionally horizontal (0°-5°)], smooth to rough joints; very thin, high angle (55°-85°) bedding. (NOTE: Last 4 inches of core run silty, medium to fine SAND.)
170	4				SLIGHT to MODERATE		
	4	C 3					
	3						
	3	174.1	17	28		173.8	
175	3	174.1	34	57	SEVERE to VERY SEVERE		Very soft to soft, severe to very severely weathered, extremely fractured, green, medium to fine-grained GABBRO-DIORITE, very close to close, tight to open, moderately dipping (35°-55°) smooth to rough joints
	3					175.7	
	3	C 4			COMPLETE		Very soft, completely weathered, gray aphanitic ARGILLITE. (Clayey SILT).
	4						
	4	179.1					
180							Bottom of Exploration at 179.1 ft Note: Observation well installed in completed borehole. Refer to installation report for details.

BORING NO. B104

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B105

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	16.8
DATUM	Boston City Base
START	15 Oct 1985
FINISH	28 Oct 1985
DRILLER	M. Fisher
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NXD3
INSIDE DIAMETER (IN)	4/3	1-3/8	2-1/8
HAMMER WEIGHT (LB)	300	140	Split inner-barrel
HAMMER FALL (IN)	24	30	

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck Mounted CME-75 and Skid Rig
BIT TYPE	Roller Bit
DRILL MUD	-
OTHER	Drove HW casing to 24 ft Went open hole to 114.0 ft. Telescoped NW casing to 134 ft, went open hole to 148 ft, Cored 148 to 168 ft. BOE.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	P U	15 34 21	S1 (8)	0.0 - 1.5		Very dense medium to fine SAND, intermixed with little silt, ash, cinders, coarse sand
	S H					
	22					- FILL -
	21					
5	16	17 6 3	NR	4.0 - 5.5		No Recovery (two attempts made)
	6					
	6					
	9				7.5	
	11					
10	29	5 3 5	S2 (12)	9.0 - 10.5		Loose gray silty fine SAND, trace peat fibers and shells, 1-inch layer of gray silty clay
	18					
	19					
	19					- FILL -
	19					
15	33	3 7 4	S3 (12)	14.0 - 15.5		Stiff gray ORGANIC SILT, little fine sand, trace gravel with a 2-inch layer of gray silty fine sand
	24					
	28					- FILL -
	27					
	28					
20	68	2 1 3	S4 (16)	19.0 - 20.5		Loose gray silty fine SAND, trace shells with occasional pockets of gray silty clay, (faint organic odor)
	49					NOTE: (Driller indicated fine SAND and SILT coming up in the wash)
	44					
	46					- FILL -
	84				24.0	
25		1 1 1	S5 (18)	24.0 - 25.5		Very soft to soft gray fine sandy ORGANIC SILT, little shells, trace peat fiber (OL-SM)
					29.0	
30		2 3	S6 (12)	29.0 - 30.0	30.0	Medium stiff brown FIBROUS PEAT (Pt)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	148.0 ft
ROCK CORED (LIN FT)	20.0 ft
SAMPLES	30S, 5U, 3T, 4C

BORING NO. B105

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B105
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		5	S6B (6)	30.5	30.0	Loose, gray silty fine SAND (SM)
35		16 11 18	S7 (14)	34.0 - 35.5		Medium dense brown-gray fine SAND interbedded with silty fine SAND, occasional partings of gray silt and silty clay (SP-SM)
		4	S8 (6)	39.0	39.5	Loose gray fine SAND, little silt (SM)
40		4 6	S8B (12)	39.5 - 40.5		Stiff gray silty CLAY, with frequent partings and seams of gray fine sand (CL)
45		2 4 4	S9 (18)	44.0 - 45.5		Medium stiff to stiff gray silty CLAY with occasional fine sand partings (CL)
		P U S H	U1 (24)	46.0 - 48.0		Gray silty CLAY with fine sand partings (CL)
		3 5 6	S10 (18)	48.0 49.5		Stiff gray silty CLAY with occasional fine sand partings (CL)
50		P U S H	T1 (21)	50.0 - 52.0		
55		1 2 3	S11 (18)	54.0 - 55.5		Medium stiff gray silty CLAY (CL)
60		P U S H	U2 (24)	59.0 - 61.0		
		2 3 4	S12 (18)	61.0 - 62.5		Medium stiff gray silty CLAY (CL)
65		WOR 3 4	S13 (18)	64.0 - 65.5		Medium stiff gray silty CLAY (CL)
70		P U S H	T2 (24)	69.0 - 71.0		

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B105
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		P U S H	T2 (24)	69.0 - 71.0		
		WOR 6 6	S14 (18)	71.0 - 72.5		Stiff gray silty CLAY (CL)
75		P U S H	U3 (24)	74.0 - 76.0		
		WOR 4 4	S15 (18)	76.0 - 77.5		Medium stiff to stiff gray silty CLAY (CL)
80		WOR/ 12" 5	S16 (18)	79.0 - 80.5		Medium stiff gray silty CLAY (CL)
85		P U S H	U4 (24)	84.0 - 86.0		
		WOR/ 18"	S17 (18)	86.0 - 87.5		Very soft gray silty CLAY (CL)
90		WOR/ 18" PUSH/ 6"	T3 (24)	89.0 - 91.0		
		WOR/ 18"	S18 (18)	91.0 - 92.5		Very soft gray silty CLAY (CL)
95		P U S H	U5 (24)	94.0 - 96.0		
		WOR/ 18"	S19 (18)	96.0 - 97.5		Very soft gray silty CLAY (CL)
100		WOR/ 18"	S20 (18)	99.0 - 100.5		Very soft gray silty CLAY (CL)
105		WOR/ 18"	S21 (18)	104.0 - 105.5		Very soft gray silty CLAY (CL)
110		7 21	S22 (16)	109.0 - 110.5	109.5	Hard gray silty CLAY with a 3-inch layer of fine sand

BORING NO. B105

TEST BORING REPORT

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		14	S22 (16)	109.0 - 110.5		Hard gray silty CLAY with a 3-inch layer of fine sand (CL-SP)
115		63 37 72	S23 (10)	114.0 - 115.5		Very dense gray coarse to fine sandy GRAVEL, trace silt, clay (bonded in-situ) (GM) - GLACIAL TILL -
120		*152 *132 *146	NR	11B.5 - 120.0		(No Recovery) NOTE: *(Indicates that split spoon was driven with a 300-lb hammer falling 24-inches)
125		116 120/4" *18/2" *43	S24 (12)	124.0 - 125.5		Very dense gray silty fine SAND, little medium sand, trace coarse sand, gravel (well bonded in-situ) (SM) - GLACIAL TILL -
130		*47 *74 *105	S25 (14)	129.0 - 130.5		Very dense gray SILT, little medium to fine sand, trace coarse sand, gravel, clay with occasional pockets of fine sand and clay (very well bonded in-situ) (ML-SM) - GLACIAL TILL - NOTE: *(Indicates that split spoon was driven with a 300-lb hammer falling 24-inches)
135		*40 *96 *100/3"	S26 (10)	134.0 - 135.3		Very dense gray clayey SILT, little medium to fine sand, trace coarse sand, gravel (very well bonded in-situ) (MH-SM) - GLACIAL TILL - NOTE: *(Indicates that split spoon was driven with a 300-lb hammer falling 24-inches)
140		*155 *100/0"	S27 (1)	139.0-139.5		Very dense gray GRAVEL (GP) NOTE: (Split spoon pushing gravel--poor recovery) NOTE: *(Indicates that split spoon was driven with a 300-lb hammer falling 24-inches)
145		*69 *100/3"	S2B (7)	144.0-144.8	144.0	Very soft, completely weathered, gray aphanitic ARGILLITE. (Clayey SILT) NOTE: *(Indicates that split spoon was driven with a 300-lb hammer falling 24-inches)
					148.0	(NOTE: See Core Boring Report, page 5.)
150						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B105
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
							NOTE: (Roller Bit refusal at 148.0 ft)
						148.0	
	7	148.0	58	97	SLIGHT to MODERATE		Medium to soft, slightly to moderately weathered, extremely to slightly fractured, gray, aphanitic ARGILLITE, very close to close, tight to open, horizontal (0°- 5°) and steeply dipping (55°- 85°) smooth to rough joint; very thin, high angle (55°- 85°) bedding.
150	7						
	3	C 1					
	5						
	5	153.0	21	35			
	6	153.0	57	95	SLIGHT to MODERATE		Medium to soft, slightly to moderately weathered, slightly fractured to sound, gray, aphanitic ARGILLITE, close, tight to open, horizontal (0°- 5°) and steeply dipping (55°- 85°), smooth to rough joints; very thin, high angle (55°- 85°) bedding with occasional calcite veins.
155	5						
	6	C 2					
	6						
	6	158.0	45	75			
	6	158.0	18	30	SLIGHT to MODERATE		Medium to soft, slightly to moderately weathered, slightly fractured, gray, aphanitic ARGILLITE, close, open, steeply dipping (55°- 85°), rough joints; very thin, high angle (55°- 85°) bedding.
	6						
160		C 3					
	6						
	5						
	6	163.0	13	22			
	5	163.0	60	100	SLIGHT to MODERATE		Medium, slightly to moderately weathered, moderately to slightly fractured (extremely fractured at 163.6 ft - 164.0 ft and 165.1 ft - 165.3 ft), gray, aphanitic ARGILLITE, very close to close, steeply dipping (55°- 85°) smooth to rough joints; very thin, high angle (55°- 85°) bedding.
	5						
165		C 4					
	5						
	5						
	5	168.0	34	57			
							Bottom of Exploration at 168.0 ft
170							

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B106

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 3
LOCATION	See Plan
ELEVATION	14.6
DATUM	Boston City Base
START	20 Sept 1985
FINISH	23 Sept 1985
DRILLER	G.Brouilette
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW	S	-
INSIDE DIAMETER (IN)	4	1 3/8 /2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	*All samples designated with an "A" taken with a 2-inch I.D. split spoon for environmental assessment

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
				0.0-0.5	0.5	Cobble Stones
	10	36 56	S1A (18)	0.5 - 2.0		Very dense black-brown coarse to fine gravelly SAND, trace silt - FILL -
	41	36				
	56	17 12	S1 (10)	2.0 - 4.0		Medium dense brown coarse to fine SAND, little silt, trace gravel - FILL -
	46	7 5				
5	4	4 4	S2A (18)	4.0 - 6.0		Loose gray fine SAND, little coarse to medium sand, little silt, trace gravel - FILL -
	5	4 4				
	5	2 2	S2 (6)	6.0 - 8.0		Loose gray coarse to fine SAND, little gravel, little silt - FILL -
	5	2 2				
	5					
10	6	6 4	S3A (18)	9.0 - 11.0		Medium stiff gray fine sandy SILT, little gravel - FILL -
	5	2 2				
	6	1 1	S3 (24)	11.0 - 13.0		Very soft gray clayey SILT, little coarse to fine sand - FILL -
	6	1 1				
	5					
15	5	2 2	S4A (24)	14.0 16.0		Soft gray fine sandy SILT, little clay - FILL -
	6	2 2				
	6	2 2	S4 (24)	16.0 - 18.0		Loose gray silty fine SAND, little clay - FILL -
	7	2 2				
	8					
20	17	23 23	S5A (18)	19.0 - 21.0		Dense gray-black silty fine SAND, little coarse to medium sand, little gravel - FILL -
	21	19 20				
	32	5 9	S5 (18)	21.0 - 23.0		Medium dense, gray medium to fine SAND, little coarse sand, little gravel - FILL -
	39	10 10				
	45					
25	28	20 5	S6A (2)	24.0 - 26.0		Medium dense gray coarse to fine SAND, trace silt - FILL -
	24	5 5				
	31	4 2	S6 (3)	26.0 - 28.0		Loose gray coarse to medium SAND, little fine sand, trace silt - FILL -
	31	4 4				
	29				29.0	
30	20	4 3	S7A	29.0 -		

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
23 Sept 1985	10:25	0.5 hr	15.0	86.0	8.6

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	86.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	18S, 8AS

BORING NO. B106

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B106
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	19	4 5	S7A (24)	- 31.0		Medium stiff gray-brown clayey ORGANIC SILT (OH)
	14 12	3 2 1 1	S7 (24)	31.0 - 33.0		Soft gray-brown clayey ORGANIC SILT (OH)
	12					
35	150 72	2 2 2 6	S8A (24)	34.0 - 36.0	36.0	Soft gray-brown clayey ORGANIC SILT (OH)
	52 62	3 11 9 10	S8 (24)	36.0 - 38.0	38.0	Very stiff gray silty CLAY (CL) (Organic odor)
	65					
40		3 4 4 5	S9 (24)	39.0 - 41.0		Medium stiff to stiff gray silty CLAY, with fine sand partings (CL)
45		2 2 4 5	S10 (24)	44.0 - 46.0		Medium stiff gray silty CLAY, with fine sand partings (CL)
50		2 2 4 5	S11 (24)	49.0 51.0		Medium stiff gray silty CLAY (CL)
55		1 2 3 4	S12 (24)	54.0 - 56.0		Medium stiff gray silty CLAY (CL)
60		1 2 4 4	S13 (24)	59.0 61.0		Medium stiff gray silty CLAY (CL)
65		1 2 2 2	S14 (24)	64.0 - 66.0		Soft to medium stiff gray silty CLAY (CL)
70		1 1	S15	69.0 -		

BORING NO. B106

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B106
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		2 4	S15 (24)	- 71.0		Soft gray silty CLAY (CL)
75		WOR/6" 1 2 4	S16 (24)	74.0 - 76.0		Soft gray silty CLAY (CL)
80		WOR WOR WOR 1	S17 (24)	79.0 - 81.0		Very soft gray silty CLAY (CL)
85		WOR/ 24"	S18 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
						Bottom of Exploration 86.0 ft.
90						

BORING NO. B106

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B107

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 3
LOCATION	See Plan
ELEVATION	16.7 ft
DATUM	Boston City Base
START	23 Sept 1985
FINISH	24 Sept 1985
DRILLER	G. Brouilette
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW	S	-
INSIDE DIAMETER (IN)	4	1 3/8/2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	*All samples designated with an "A" were taken with a 2-inch I.D. split spoon for environmental assessment

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	2 10	29 30 20 15	S1A (12)	0.0 - 2.0		Very dense dark brown coarse to fine SAND, little gravel, trace silt, trace roots - FILL -
	29	10 10 9 50	S1 (12)	2.0 - 4.0		Medium dense dark brown silty coarse to fine SAND, little gravel - FILL -
5	25 5	20 20 15 8	S2A (18)	4.0 - 6.0		Dense dark gray coarse to fine SAND, little gravel, little silt - FILL -
	6 7	2 3 2 2	S2 (18)	6.0 - 8.0	8.0	Loose gray fine SAND, little silt - FILL -
	10					
10	4 4	2 2 2 3	S3A (24)	9.0 - 11.0		Medium stiff gray clayey SILT, little fine sand, little organics, trace shells - FILL -
	5 5	1 1 1 1	S3 (24)	11.0 - 13.0		Very soft gray clayey SILT, little fine sand, organics, trace shells - FILL -
	5					
15	17 17	3 3 2 3	S4A (24)	14.0 - 16.0		Medium stiff mottled gray-black clayey SILT, little fine sand, organics, trace shells - FILL -
	12 12	2 1 1 1	S4 (24)	16.0 - 18.0		Very soft gray-black SILT, little fine sand, organics - FILL -
	14					
20		2 4 5 6	S5A (18)	19.0 - 21.0	21.0	Stiff mottled yellow-gray SILT, little fine sand, little clay, trace shells - FILL -
		1 1 2 4	S5 (24)	21.0 - 23.0		Soft black-brown ORGANIC SILT, little fine sand, little shells, trace clay (OL)
25		6 6 3 3	S6A (6)	24.0 - 26.0		Stiff black-brown ORGANIC SILT, trace fine sand, clay, shells (OL)
		1 1 3 3	S6 (18)	26.0 - 28.0		Soft to medium stiff black-brown ORGANIC SILT, trace fine sand, shells (OL)
30		3 3	S7A	29.0 -		

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
24 Sept 1985	11:24	0.5 hr	15.0	91.0	15.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	91.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	19S, 8AS

BORING NO. B107

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B107
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		8 10	S7A (24)	- 31.0		Stiff black-brown ORGANIC SILT, little fiberous peat, trace fine sand (OL-Pt)
		3 4 3 10	S7 (24)	31.0 - 33.0		Stiff black-brown ORGANIC SILT, trace peat, shells (OL)
					33.5	
35		21 33 76 100	S8A (18)	34.0 - 36.0		Hard mottled yellow-gray SILT, trace shells, trace organics (OL)
		30	S8 (2)	36.0 - 36.5	36.5	
		30 20 20	S8B (2)	36.5 - 38.0		Hard blue-gray silty CLAY, trace shells, trace organics (CL)
					39.0	
40		10 12 15 17	S9 (18)	39.0 - 41.0		Dense gray fine SAND, little silt, trace shells (SM)
					42.0	
45		4 6 10 6	S10 (24)	44.0 - 46.0		Very stiff gray clayey SILT, little fine sand (MH)
					47.5	
50		1 2 4 5	S11 (24)	49.0 - 51.0		Medium stiff gray silty CLAY with fine sand partings (CL)
55		1 2 3 4	S12 (24)	54.0 - 56.0		Medium stiff gray silty CLAY with fine sand partings (CL)
60		1 2 4 4	S13 (24)	59.0 - 61.0		Medium stiff gray silty CLAY with fine sand partings (CL)
65		2 2 4 4	S14 (24)	64.0 - 66.0		Medium stiff gray silty CLAY (CL)
70		1 2	S15	69.0 -		

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B107
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		3 4	S15 (24)	- 71.0		Medium stiff gray silty CLAY (CL)
75		1 2 4 4	S16 (24)	74.0 - 76.0		Medium stiff gray silty CLAY (CL)
80		WOR WOR WOR 3	S17 (24)	79.0 - 81.0		Very soft gray silty CLAY (CL)
85		WOR WOR WOR 3	S18 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
90		WOR WOR WOR 3	S19 (24)	89.0 - 91.0		Very soft gray silty CLAY (CL)
						Bottom of Exploration 91.0 ft
95						

BORING NO. B107

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B108

PROJECT Boston Fan Pier, Boston, Massachusetts
CLIENT HBC Associates, Boston, Massachusetts
CONTRACTOR Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO. 5556
SHEET NO. 1 OF 3
LOCATION See Plan
ELEVATION 16.5
DATUM Boston City Base
START 19 Sept 1985
FINISH 23 Sept 1985
DRILLER R. Heath
H&A REP M. Fisher

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	-
INSIDE DIAMETER (IN)	4/3	1-3/8/2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE Skid Rig
BIT TYPE Roller Bit
DRILL MUD None
OTHER *All samples designated with an "A" were taken with a 2-inch I.D. split spoon for environmental assessment

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	10 29	29 39 34 19	S1A (20)	0.0 - 2.0		Very dense brown coarse to fine gravelly SAND, little silt - FILL -
	20 17	9 12 12 13	NR (0)	2.0 - 4.0		No Recovery
	14					
5	10 12	2 2 3 3	S2A (3)	5.0 - 7.0		Loose gray-yellow coarse to medium SAND, little gravel, little silt, little clay - FILL -
	13 14	3 3 4 4	S1 (6)	7.0 - 9.0		Medium stiff gray-yellow clayey SILT, little medium to fine sand - FILL -
	15					
10	10	4 23 100/2'L75*/4" 84*	S3A (22)	9.5 - 11.5		Very dense gray coarse to fine SAND, little silt, clay, gravel. * (300-lb hammer.)
	206 142	10 70 17 13	S2 (8)	11.5 - 13.5		Very dense dark gray coarse to fine gravelly SAND, trace silt - FILL -
	30					
15	22 10	5 3 2 3	S4A (4)	14.5 - 16.5		Loose black coarse to fine SAND, little gravel, little silt, (oily) - FILL -
	8 12	3 2 2 12	S3 (6)	16.5 - 18.5		Loose dark gray coarse to fine SAND, trace silt - FILL -
	15					
20	18 10	20 23 14 5	S5A (8)	19.5 - 21.5		Dense black coarse to fine sandy GRAVEL, little silt - FILL -
	26 17	3 5 20 9	S4 (10)	21.5 - 23.5		Dense gray coarse to fine SAND, some shells, little gravel, trace silt - FILL -
	26					
25	28 14	12 11 8 7	S6A (8)	24.5 - 26.5		Medium dense gray GRAVEL, little coarse to fine sand, little silt - FILL -
	29 34	4 8 14 13	S5 (12)	26.5 - 28.5		Very stiff blue gray fine sandy SILT, trace clay - FILL -
	31					
30	30		NR	29.5		No Recovery

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
23 Sept 1985	8:45	1 hr	30.0	86.5	10.0

SAMPLE IDENTIFICATION

O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
S SPLIT SPOON
WOR Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	86.5 ft
ROCK CORED (LIN FT)	-
SAMPLES	17S, 8AS

BORING NO. B108

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B108
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	55		NR (0)	- 31.5		No Recovery
	61 66	16 19 23 24	S6 (24)	31.5 - 33.5		Hard gray coarse to fine sandy SILT, trace gravel - FILL -
	68					
35	64 80	12 12 13 17	S7A (18)	34.5 - 36.5	36.5	Very stiff gray clayey SILT, little fine sand, little wood - FILL -
	71 57	8 8 7 5	S7 (14)	36.5 - 38.5		Medium dense gray fine SAND, little silt (SM)
	52					
40	40 38	9 11 14 15	S8A (20)	39.5 - 41.5	41.5	Medium dense gray fine SAND, little silt (SM)
	55 37	4 10 7 12	S8 (14)	41.5 - 43.5		Very stiff gray fine sandy SILT, little clay (MH-SM)
	28 32				44.0	
45		4 6 7 9	S9 (18)	44.5 - 46.5		Stiff gray silty CLAY (CL)
50		4 4 4 6	S10 (24)	50.0 - 52.0		Medium stiff to stiff gray silty CLAY with fine sand partings (CL)
55		3 3 4 5	S11 (24)	55.0 - 57.0		Medium stiff gray silty CLAY (CL)
60		4 3 5	S12 (18)	60.0 - 61.5		Medium stiff to stiff gray silty CLAY (CL)
65		4 5 6	S13 (24)	65.0 - 66.5		Stiff gray silty CLAY (CL)
70						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B108
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		2 4 5	S14 (18)	70.0 - 71.5		Stiff gray silty CLAY (CL)
75		2 3 3	S15 (18)	75.0 - 76.5		Medium stiff gray silty CLAY (CL)
80		4 7 6	S16 (18)	80.0 - 81.0		Medium stiff gray silty CLAY (CL)
85		WOR/ 12" 1	S17 (14)	85.0 - 86.5		Very soft gray silty CLAY (CL)
						Bottom of Exploration 86.5 ft
90						

BORING NO. B108

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B109

PROJECT Boston Fan Pier, Boston, Massachusetts
CLIENT HBC Associates, Boston, Massachusetts
CONTRACTOR Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO. 5556
SHEET NO. 1 OF 3
LOCATION See Plan
ELEVATION 17.1
DATUM Boston City Base
START 19 Sept 1985
FINISH 20 Sept 1985
DRILLER G. Brouilette
H&A REP R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	-
INSIDE DIAMETER (IN)	4/3	1-3/8/2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES
RIG TYPE Truck
BIT TYPE Roller Bit
DRILL MUD None
OTHER *Samples designated with an "A" taken with a 2-inch I.D. split spoon for environmental assessment.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	75	30* 30*	S1A (18)	0.0 - 2.0		Hard green coarse to fine sandy SILT, little gravel little brick, asphalt *(300-lb hammer) - FILL -
	51	31* 30*				
	40	15* 12*	S1 (24)	2.0 - 4.0		Hard green coarse to fine sandy SILT, little gravel, little brick, asphalt, oily tar - FILL -
	39	6* 25*				
5	7	15 10	S2A (12)	4.0 - 6.0		Very stiff green coarse to fine sandy SILT, little gravel, little brick - FILL -
	10	9 10				
	10	15 10	S2 (12)	6.0 - 8.0		Medium dense dark gray coarse to fine gravelly SAND, little silt, little brick - FILL -
	9	9 10				
	8					
10	16					
	10	4 4	S3A (2)	10.0 - 12.0		Medium stiff gray silty CLAY, some coarse to fine sand, trace gravel, trace brick - FILL -
	8	3 5				
	8	4 5	S3 (6)	12.0 - 14.0		Medium stiff to stiff gray silty CLAY, some coarse to fine SAND, trace gravel, trace brick - FILL -
	18	3 5				
15	17	5 8	S4A (12)	14.0 - 16.0		Very stiff gray silty CLAY, some coarse to fine SAND, little gravel, little brick - FILL -
	12	8 18				
	25	7 8	S4 (2)	16.0 - 18.0		Medium dense brown silty coarse to fine SAND, trace brick - FILL -
	24	9 6				
	15					
20	16	11 9	S5A (6)	19.0 - 21.0		Stiff to very stiff gray silty CLAY, some coarse to fine sand, little gravel, little brick - FILL -
	16	6 9				
	18	1 2	S5 (9)	21.0 - 23.0		Medium stiff gray silty CLAY, little coarse to fine sand, little gravel, little brick - FILL -
	21	4 5				
	26					
25	32	7 9	S6A (24)	24.0 - 26.0		Very stiff yellow-gray silty CLAY, trace coarse to fine sand, trace brick - FILL -
	29	10 10				
	33	2 3	S6 (24)	26.0 - 28.0		Medium stiff gray clayey SILT, trace coarse to fine sand, trace brick
	35	4 4				
	40					
30	70	14 16	S7A	29.0 - 31.0		- FILL -

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
20 Sept 1985	10:15	0.5 hr	10.0	106.0	12.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	106.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	22S, 8AS

BORING NO. B109

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B109
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		50	S7A	29.0 -		Very dense gray-yellow silty coarse to fine SAND,
	40	70	(6)	31.0		little gravel
		51	S7	31.0 -		- FILL -
	81	17	(12)			Dense gray-yellow coarse to fine sandy GRAVEL,
		19				little wood
	120	6		33.0		
	59					- FILL -
		11	S8A	34.0 -		
35	37	10	(24)			Very stiff gray silty CLAY, little coarse to fine sand
		11				- FILL -
	34	12		36.0		
		3	S8	36.0 -		
	35	5	(18)			Medium dense gray silty coarse to fine SAND, little clay
		7				
	45	10		38.0		- FILL -
	55					
		4	S9	39.0 -		
40	32	5	(24)			Medium dense gray coarse to fine SANO, some silt, little peat (FILL MIXED WITH ORGANICS)
		5				
	29	9		41.0		- FILL -
	37				42.0	
	37					
	50					
	48	4	S10	44.0 -		Stiff black ORGANIC SILT, little coarse to fine sand
45		4	(24)			
		4				(OL)
	40	6		46.0		
	40				47.0	
	45					
	41					
		1	S11	49.0 -		Soft black ORGANIC SILT (OL)
50	40	1	(24)			
		3				
	29	3		51.0		
	34					
	40					
	41				54.0	
		1	S12	54.0 -		Medium stiff gray silty CLAY (CL)
55		3	(24)			
		4				
		4		56.0		
		2	S13	59.0 -		Medium stiff gray silty CLAY (CL)
60		2	(24)			
		4				
		5		61.0		
		1	S14	64.0 -		Medium stiff gray silty CLAY (CL)
65		2	(24)			
		3				
		4		66.0		
		2	S15	69.0 -		
70		2		71.0		

BORING NO. B109

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B109
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		3 4	S15 (24)	69.0 - 71.0		Medium stiff gray silty CLAY (CL)
75		2 3 6 6	S16 (24)	74.0 - 76.0		Stiff gray silty CLAY (CL)
80		1 2 4 6	S17 (24)	79.0 - 81.0		Stiff gray silty CLAY (CL)
85		WOR/12" 1 2	S18 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
90		WOR / 24"	S19 (24)	89.0 - 91.0		Very soft gray silty CLAY (CL)
95		WOR WOR 2 3	S20 (24)	94.0 - 96.0		Very soft gray silty CLAY (CL)
100		WOR / 24"	S21 (24)	99.0 - 101.0		Very soft gray silty CLAY (CL)
105		WOR / 24"	S22 (24)	104.0 106.0		Very soft gray silty CLAY (CL)
						Bottom of Exploration 106.0 ft
110						

BORING NO. B109

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B110

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 3
LOCATION	See Plan
ELEVATION	15.8
DATUM	Boston City Base
START	18 Sept 1985
FINISH	19 Sept 1985
DRILLER	S. Koehler
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	-
INSIDE DIAMETER (IN)	4/3	1-3/8/2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	*All samples designated with an "A" taken with a 2-inch I.D. split spoon for environmental assessment

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		66 170 155	S1A (14)	0.0 - 1.5		Very dense light brown coarse to fine gravelly SAND, trace silt - FILL -
		65 18 140	S1 (8)	1.5 - 3.0		Hard brown coarse to fine sandy SILT, little gravel, trace brick - FILL -
					4.0	
5	25	7 9 9	S2A (14)	4.5 - 6.0		Very stiff gray clayey SILT, little fine sand - FILL -
	23 21 16	6 4 3	S2 (4)	6.0 - 7.5		Medium stiff gray clayey SILT, little fine sand - FILL -
10	20 25	2 2 2	S3A (13)	9.5 - 11.0		Soft to medium stiff gray clayey SILT, little coarse to fine sand, fine gravel - FILL -
	20 20 24	1 1 1	S3 (12)	11.0 - 12.5		Very soft to soft gray clayey SILT, little coarse sand, fine gravel - FILL -
15	21 31	1 1 2	S4A (9)	14.5 - 16.0	16.0	Soft gray clayey SILT, trace fine gravel - FILL -
	30 28 26	1 1 1	S4 (12)	16.0 - 17.5		Very soft gray silty fine SAND, trace clay, trace shells - FILL -
20	30 2	2 4 4	S5A (16)	19.5 - 21.0	21.0	Medium stiff to stiff gray fine sandy SILT, trace clay - FILL -
	2 17 26	6 8 14	S5 (16)	21.0 - 22.5		Medium dense gray silty fine SAND (SM)
25	25 33	8 17 24	S6A (12)	24.5 - 26.0		Dense yellow-gray fine SAND, little silt (SM)
	30 36 30	12 12 7	S6 (12)	26.0 - 27.5	29.0	Medium dense yellow fine SAND, little silt (SM)
30	32	4	S7A	29.5 - 31.00		Stiff gray clayey SILT, little fine sand (MH)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
19 Sept 1985	13:45	0.25	19.0	86.0	12.3

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	86.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	18S, 8AS

BORING NO. B110

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B110
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		6 6	S7A (16)	29.5 - 31.0	31.0	Stiff gray clayey SILT, little fine sand (MH)
		3 3 8	S7 (17)	31.0 - 32.5		Stiff gray silty CLAY (CL)
35		3 3 6	S8A (16)	34.5 - 36.0		Stiff gray silty CLAY with fine sand partings (CL)
		2 2 3	S8 (17)	36.0 - 37.5		Medium stiff gray silty CLAY with fine sand partings (CL)
40		2 3 3	S9 (16)	39.5 - 41.0		Medium stiff gray silty CLAY with fine sand partings (CL)
45		2 2 3	S10 (17)	44.5 - 46.0		Medium stiff yellow-gray silty CLAY with fine sand partings (CL)
50		2 3 3	S11 (18)	49.5 - 51.0		Medium stiff yellow-gray silty CLAY with fine sand partings (CL)
55		2 3 4	S12 (18)	54.5 - 56.0		Medium stiff yellow-gray silty CLAY with fine sand partings (CL)
60		2 3 3	S13 (18)	59.5 - 61.0		Medium stiff yellow-gray silty CLAY with fine sand partings (CL)
65		2 2 3	S14 (18)	64.5 - 66.0		Medium stiff yellow-gray silty CLAY with fine sand partings (CL)
70		1	S15 (18)	69.5 - 71.0		Medium stiff yellow-gray silty CLAY (CL)

BORING NO. B110

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B110
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		3 4	S15 (18)	69.5 - 71.0		Medium stiff yellow-gray silty CLAY (CL)
75		2 4 5	S16 (18)	74.5 - 76.0		Medium stiff yellow-gray silty CLAY (CL)
80		4 3 4	S17 (17)	79.5 - 81.0		Medium stiff yellow-gray silty CLAY (CL)
85		WOR/ 18"	S18 (18)	84.5 - 86.0		Very soft yellow-gray silty CLAY (CL)
						Bottom of Exploration 86.0 ft
90						

BORING NO. B110

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B111

PROJECT Boston Fan Pier, Boston, Massachusetts
CLIENT HBC Associates, Boston, Massachusetts
CONTRACTOR Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO. 5556
SHEET NO. 1 **OF** 2
LOCATION See Plan
ELEVATION 17.3
DATUM Boston City Base
START 17 Sept 1985
FINISH 18 Sept 1985
DRILLER C. Koehler
H&A REP R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	-
INSIDE DIAMETER (IN)	4/3	1-3/8/2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES
RIG TYPE Truck
BIT TYPE Roller Bit
DRILL MUD None
OTHER *All samples designated with an "A" taken with a 2-inch I.D. split spoon for environmental assessment

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.4	Concrete
		9 11 17	S1A (12)	0.4 - 1.9		Medium dense light brown medium to fine SAND, little gravel, little coarse sand - FILL -
		21 23 50	S1 (12)	1.9 - 3.4		Very dense brown silty medium to fine SAND, some asphalt, little gravel, little brick - FILL -
5	26 25	22 27 31	NR (0)	4.5 - 6.0		(No Recovery 2-inch I.D. Spoon)
	50 92	25 32 30	S2 (6)	6.0 - 7.5		Very dense gray-brown silty fine SAND, some gravel, coarse to medium sand, little brick - FILL -
	81				8.0	
10	25 38	21 17 8	S2A (6)	9.5 - 11.0		Very stiff gray-black medium to fine sandy ORGANIC SILT, little gravel - FILL -
	32 18	4 4 8	S3 (6)	11.0 - 12.5		Stiff gray-black medium to fine sandy ORGANIC SILT, little gravel, trace brick - FILL -
	11 13					
15	10	3 1 2	NR (0)	14.5 - 16.0		(No Recovery 2-inch I.D. Spoon)
	11	1 1 1	S4 (3)	16.0 - 17.5		Very soft to soft gray organic silty coarse to fine SAND, trace gravel, trace peat - FILL -
	12 14					
20	28 22	5 5 5	S3A (10)	19.5 - 21.0		Stiff gray ORGANIC SILT, little coarse to fine sand, little gravel - FILL -
	20 18	1 1 1	S5 (4)	21.0 - 22.5		Very soft to soft gray-black coarse to fine sandy ORGANIC SILT - FILL -
	19					
25	5 7	6 5 7	S4A (14)	24.5 - 26.0		Stiff black-gray ORGANIC SILT, some medium to fine sand, little gravel, trace brick, trace shells, trace wood - FILL -
	13	9 8 12	S6 (12)	26.0 - 27.5		
	29 28					
30	8	17	S5A	29.5 - 31.5		

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
18 Sept 1985	11:00	0.25	25.0	66.0	14.3

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	66.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	14S, 6AS

BORING NO. B111

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B111
FILE NO. 5556
SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	18	19 24 28	S5A (12)	29.5 - 31.5		Dense gray-black organic silty medium to fine SAND, little gravel, little coarse sand, trace brick - FILL -
	36 22	11 15 11	S7 (12)	31.5 - 33.0	33.0	Medium dense gray-black medium to fine SAND, little organic silt, trace brick - FILL -
	12					
35	10 12	7 7 7 10	S6A (16)	34.5 - 36.5		Stiff black ORGANIC SILT, (very oily) (OL)
	12 10	3 2 3	S8 (12)	36.5 - 38.0		Medium stiff black ORGANIC SILT (OL)
	10					
40	19 15	1 1 1	S9 (14)	39.5 - 41.0		Very soft to soft black ORGANIC SILT (OL)
	14					
	12					
	24					
45	46 34	WOR/ 18"	S10 (16)	44.5 - 46.0		Very soft black ORGANIC SILT (OL)
	18					
	20					
	18					
50	45 35	WOR/ 18"	S11 (6)	49.5 - 51.0		Very soft black ORGANIC SILT (OL)
	36					
	32					
	23					
55	48 39	3 1 2	S12 (6)	54.5 - 56.0		Soft black ORGANIC SILT (OL)
	39				57.0	
	38					
	36					
60		3 3 5	S13 (17)	59.5 - 61.0		Stiff gray silty CLAY (CL)
65		2 5 4	S14 (17)	64.5 - 66.0		Stiff gray silty CLAY (CL)
						Bottom of Exploration 66.0 ft
70						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B112

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	15.2
DATUM	Boston City Base
START	1 Oct 1985
FINISH	4 Oct 1985
DRILLER	G. 8rouilette
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NX
INSIDE DIAMETER (IN)	4/3	1-3/8	2-1/8
HAMMER WEIGHT (LB)	300	140	Split
HAMMER FALL (IN)	24	30	Barrel

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck mounted CME-55
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	Spun casing from 2.0 ft to 9.0 ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	5	5	S1 (12)	0.5 - 2.0	0.5	Cobblestones
	10	6 15				Medium dense black coarse to fine SAND, little silt, trace gravel - FILL -
						Boulders 3.0 ft to 4.0 ft
	Drilled				4.0	
5	casing	10 5	S2 (12)	4.0 - 6.0		Medium stiff gray fine sandy SILT, little clay
	to	2 2				- FILL -
	9 feet					
					8.0	
10	10	5 2	S3 (6)	9.0 - 11.0		Very loose gray-black fine SAND, little silt, trace shells - FILL -
	15	1 1				
	20					
	21					
	26					
15	44	6 2	S4 (24)	14.0 - 16.0		Very loose to loose gray-black fine SAND, little silt, trace shells - FILL -
	27	2 2				
	28					
	28					
	26					
20	41	5 3	S5 (24)	19.0 - 21.0		Loose gray fine SAND, little silt, shells (organic odor)
	25	5 7				- FILL -
	42				22.0	
	49					
	50					
25	50	1 1	S6 (24)	24.0 - 26.0		Very soft to soft gray fine sandy ORGANIC SILT, trace shells, trace peat (OL-SM)
	40	1 1				
	35					
	36					
	49					
30		1 1	S7	29.0 - 31.0		

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
	Installed Observation Well				

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	147.0 ft
ROCK CORED (LIN FT)	10.0 ft
SAMPLES	28S, 2C

BORING NO. B112

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B112
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		2 2	S7 (24)	29.0 - 31.0		Soft gray ORGANIC SILT, little fine sand, trace shells, trace peat (OL)
					33.0	
35		7 9 11 12	S8 (24)	34.0 - 36.0		Very stiff mottled gray-yellow fine sandy SILT, little clay (ML-SM)
					37.5	
40		7 6 7 8	S9 (24)	39.0 - 41.0		Stiff gray silty CLAY with fine sand partings (CL)
45		WOR/ 12" 2 3	S10 (24)	44.0 - 46.0		Very soft to soft gray silty CLAY with fine sand partings (CL)
50		WOR/ 24"	S11 (24)	49.0 - 51.0		Very soft gray silty CLAY (CL)
55		WOR/ 24"	S12 (24)	54.0 - 56.0		Very soft gray silty CLAY (CL)
60		WOR/ 24"	S13 (24)	59.0 - 61.0		Very soft gray silty CLAY (CL)
65		WOR/ 24"	S14 (24)	64.0 - 66.0		Very soft gray silty CLAY (CL)
70		WOR/ 24"	S15	69.0 - 71.0		Very soft gray silty CLAY (CL)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B112
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		WOR/ 24"	S15 (24)	69.0 - 71.0		Very soft gray silty CLAY (CL)
75		WOR/ 24"	S16 (24)	74.0 - 76.0		Very soft gray silty CLAY (CL)
80		WOR/ 24"	S17 (24)	79.0 - 81.0		Very soft gray silty CLAY (CL)
85		WOR/ 24"	S18 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
90		WOR/ 24"	S19 (24)	89.0 - 91.0		Very soft gray silty CLAY (CL)
95		WOR/ 24"	S20 (24)	94.0 - 96.0		Very soft gray silty CLAY with fine sand partings (CL)
100		WOR/ 24"	S21 (24)	99.0 - 101.0		Very soft, gray silty CLAY with fine sand partings (CL)
					102.0	
105		41 51 100	S22 (8)	104.0- 105.5		Hard gray coarse to fine sandy SILT, little gravel (ML-SM) - GLACIAL TILL -
110		60 100	S23 (2)	109.0- 110.0		Very dense gray fine SAND, little gravel, little silt, trace clay (SM)

BORING NO. B112

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	TEST BORING REPORT	BORING NO. B112 FILE NO. 5556 SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110						
115		60 64 100	S24 (9)	114.0 - 115.5		Hard gray coarse to fine sandy SILT, little gravel, trace clay - GLACIAL TILL - (ML-SM)
120		61 110	S25 (6)	119.0 - 120.0		Hard gray coarse to fine sandy SILT, little gravel, trace clay - GLACIAL TILL - (ML-SM)
125		98 100/5"	S26 (12)	124.0 - 125.0		Hard gray SILT, little coarse to fine sand, trace gravel - GLACIAL TILL - (ML-SM)
130		100/6"	S27 (6)	129.0 - 129.5		Hard gray SILT, little coarse to fine sand, little gravel (ML-SM) - GLACIAL TILL -
135		100/3"	S28 (3)	134.0 - 134.2		Hard gray coarse to fine sandy SILT, little gravel (argillite fragments) (ML-SM) - GLACIAL TILL -
					139.0	
140		100/3"	NR	139.0 - 139.2		No Recovery (Completely to very serverely weathered ARGILLITE)
145		100/1"	NR	144.0 - 144.1		No Recovery
					147.0	(See Core Boring Report, page 5)
150						

BORING NO. B112

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B112
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
145							
						147.0	
	5	147.0-	58	96			Moderately hard, moderately to slightly weathered, moderately fractured, gray, aphanitic ARGILLITE; very close to closely spaced, open, shallow dipping (5°-35°), smooth joints with calcite filling; bedding parallel to joints
	5				SLIGHT to MODERATE		
	6	C 1					
150	5						
	4	152.0	14	23			
	4	152.0-	60	100			
	4				SLIGHT		Moderately hard, slightly weathered, moderately fractured to sound, gray, aphanitic ARGILLITE; very close to closely spaced, open, shallow (5°-35°) joints with calcite filling; bedding parallel to joints.
155	4	C 2					
	5						
	5	157.0	29	48			
							Bottom of Exploration 157.0 ft.
							NOTE: Observation well installed in the completed borehole. Refer to installation report for details.
160							

BORING NO. B112

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B113

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	15.8
DATUM	Boston City Base
START	11 Oct 1985
FINISH	18 Oct 1985
DRILLER	G. Brouilette
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW	S	NX D3
INSIDE DIAMETER (IN)	4	1-3/8	2-1/8
HAMMER WEIGHT (LB)	Drilled in	140	Split-liner
HAMMER FALL (IN)		30	

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE Truck mounted CME-55
BIT TYPE Roller 8it
DRILL MUD None
OTHER Installed HW casing to 25 ft. Open hole to 109 ft. Telescoped NW casing to 131.0ft Cored 134 to 154 ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	Cobblestones
		5 5 5 5	S1 (18)	0.5 - 2.5		Loose to medium dense black coarse to fine SAND, little silt, trace gravel - FILL -
5		4 3 3 5	S2 (18)	4.0 - 6.0		Loose gray silty fine SAND - FILL -
10		2 1 1 2	S3 (12)	9.0 - 11.0		Very loose gray silty fine SAND, trace shells - FILL -
15		2 1 1 1	S4 (24)	14.0 - 16.0		Very soft to soft gray clayey SILT, little fine sand - FILL -
20		1 1 1 3	S5 (24)	19.0 - 21.0		Very soft to soft gray clayey SILT, little coarse to fine sand, trace gravel - FILL -
25		1 6 5 4	S6 (20)	24.0 - 26.0		Medium dense silty fine SAND, trace shells, trace wood - FILL -
					27.0	
30		WOR 1	S7 (14)	29.0 - 31.0		Soft gray ORGANIC SILT, trace fine sand with shells (OL)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
18 Oct 1985	11:30	2.0 hr	15.0	15.4	12.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	134.0 ft
ROCK CORED (LIN FT)	20.0 ft
SAMPLES	27S

BORING NO. B113

TEST BORING REPORT

BORING NO. B113
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		2 2	S7 (24)	29.0 - 31.0		Soft gray ORGANIC SILT, trace fine sand, peat fibers, shells (OL)
35		WOR 1 2 2	S8 (24)	34.0 - 36.0		Soft gray clayey ORGANIC SILT, trace peat fibers (OH)
					38.0	
40		WOR/ 12" 1 2	S9 (24)	39.0 - 41.0		Very soft mottled gray-blue silty CLAY, with frequent fine sand partings (CL)
45		WOR/ 12" 2 4	S10 (24)	44.0 - 46.0		Very soft to soft mottled gray-blue silty CLAY, with frequent fine sand partings (CL)
50		WOR 1 3 4	S11 (24)	49.0 - 51.0		Soft to medium stiff gray silty CLAY, with occasional fine sand partings (CL)
55		WOR/ 12" 2 4	S12 (18)	54.0 - 56.0		Very soft to soft gray silty CLAY with occasional fine sand partings (CL)
60		WOR 1 3 2	S13 (24)	59.0 - 61.0		Soft to medium stiff gray silty CLAY (CL)
65		WOR/ 12" 1 3	S14 (24)	64.0 - 66.0		Very soft gray silty CLAY (CL)
70		WOR/ 12"	S15	69.0 - 71.0		Very soft gray silty CLAY (CL)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B113
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		1 2	S15 (24)	69.0 - 71.0		Very soft gray silty CLAY (CL)
75		WOR/ 18" 7	S16 (24)	74.0 - 76.0		Very soft gray silty CLAY (CL)
80		WOR/ 24"	S17 (24)	79.0 - 81.0		Very soft gray silty CLAY (CL)
85		WOR/ 24"	S18 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
90		WOR/ 24"	S19 (24)	89.0 - 91.0		Very soft gray silty CLAY (CL)
95		WOR/ 24"	S20 (24)	94.0 - 96.0		Very soft gray silty CLAY (CL)
100		WOR/ 24"	S21 (24)	99.0 - 101.0		Very soft gray silty CLAY (CL)
105		WOR/ 24"	S22 (24)	104.0 - 106.0		Very soft gray silty CLAY (CL)
					108.0	
110		10 15	S23	109.0 - 111.0		Dense gray clayey medium to fine SAND, trace coarse sand and gravel (SC) - GLACIAL TILL -

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B113
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		30 38	S23 (10)	109.0- 111.0		Dense gray clayey medium to fine SAND, trace coarse sand and gravel (well bonded in-situ) (SC) - GLACIAL TILL -
						NOTE: (Began using 3-inch Rollerbit)
115		28 37 72	S24 (18)	114.0 - 115.5		Very dense medium to fine clayey SILT, trace coarse sand, gravel (very well bonded in-situ) (MH) - GLACIAL TILL -
120		36 79 79	S25 (12)	119.0 - 120.5		Very dense gray medium to fine sandy SILT, trace coarse sand, gravel, clay (very well bonded in-situ) (ML-SM) - GLACIAL TILL -
125		100/6"	S26 (6)	124.5		Very dense gray silty medium fine SAND, trace coarse sand, gravel (very well bonded in-situ) (SM) - GLACIAL TILL -
					128.0	
130		100/5"	S27 (5)	129.4		Very soft, completely weathered, gray, aphanitic ARGILLITE.
					133.5	
135						(See Core Boring Report, page 5)

BORING NO. B113

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B113
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY RQD IN.	%	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						133.5	
	5	134.0	56	93			Soft, moderately to severely weathered, moderately to slightly fractured, gray aphanitic ARGILLITE, very close to close, tight, steeply dipping (55° - 85°) rough joints; very thin, high angle (55° - 85°) bedding.
135	5				MODERATELY SEVERE		
	5	C 1					
	5						
	4	139.0		*			
	3	139.0	36	60			Very soft, very severe to completely weathered, extremely to moderately fractured, gray aphanitic ARGILLITE; very close to close, tight to open, shallow (5°-35°) to steeply dipping, smooth to rough joints; very thin, high angle (55°-85°) bedding; occasional calcite veins.
140	3				VERY SEVERE to COMPLETE		
	4	C 2					
	5						
	5	144.0		*			
		144.0	60	100			Soft, moderate to moderately severely weathered, extremely to slightly fractured, gray aphanitic ARGILLITE; very close to close, tight to open, horizontal (0°-5°) to steeply dipping (55°-85°), smooth to rough joints (some joint sets intersect); very thin, vertical (85°-90°) bedding; frequent clay filling along joints.
145	5				MODERATE to MODERATELY SEVERE		
	5						
	5	C 3					
	5						
	6						
	5	149.0	44	*			
150		149.0	60	100	SLIGHT to MODERATE		Soft, slightly to moderately weathered, moderately fractured to sound, gray aphanitic ARGILLITE, very close to close, tight to open, horizontal (0°-5°) to steeply dipping (55°-85°), smooth to rough joints; very thin, vertical (85°-90°) bedding; clay layer 153.3 ft to 153.5 ft.
	6						
	6	C 4					
	6						
	6	154.0	36	60			
155							

Bottom of Exploration at 154.0 ft

* Note: RQD not calculated due to severity of weathering.

BORING NO. B113

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B114

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	16.5
DATUM	Boston City Base
START	8 Oct 1985
FINISH	11 Oct 1985
DRILLER	M. Fisher
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NXD3
INSIDE DIAMETER (IN)	4/3	1-3/8	2-1/8
HAMMER WEIGHT (LB)	300	140	Split-
HAMMER FALL (IN)	24	30	liner

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck mounted CME-75
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	22	32 16 7	S1 (6)	0.0 - 1.5		Medium dense brown coarse to fine SAND, little gravel, trace silt, trace glass
	18					
	10					- FILL -
	11					
5	14	3 7 9	S2 (4)	4.0 - 5.5		Medium dense brown silty coarse to fine SAND, (saturated)
	6					
	5					- FILL -
	5					
	5					
10	7	1 1 1	S3 (8)	9.0 - 10.5		Very soft to soft gray clayey SILT, trace coarse to fine sand
	7					
	6					- FILL -
	8				13.0	
	10					
15		2 2 3	S4 (18)	14.0 - 15.5		Loose gray-black fine SAND, little silt, trace shells and organic silt - INTERMIXED FILL AND ORGANIC SILT -
					16.0	
20		1 3 6	S5 (18)	19.0 - 20.5		Stiff gray ORGANIC SILT, trace shells (OL)
						(PEAT in wash water 23.0 ft - 24.0 ft)
25		9 10 12	NR	24.0 - 25.5		No Recovery
30		28 14	S6	29.0 - 31.5		Hard grayish black ORGANIC SILT, trace coarse to fine sand with shells (OL)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
11 Oct 1985	11:47		137.2	150.0	28.5

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods
(1)	Exclusive of Boulder Coring

SUMMARY

OVERBURDEN (LIN FT)	139.0 ft
ROCK CORED (LIN FT)	11.0 ft (1)
SAMPLES	24S, 5U, 3T, 4C

BORING NO. B114

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B114
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		17	S6 (5)	-31.5		Hard gray-black ORGANIC SILT, trace of coarse to fine sand and shells (OL)
					33.0	
35		6 7 13	S7 (18)	34.0 - 35.5		Very stiff brown-yellow clayey SILT with fine sand layers (MH-SM)
					38.0	
40		15 14 24	S8 (14)	39.0 - 40.5		Dense gray silty fine SAND (SM)
					43.5	
45		P U S H	T1 (27)	45.0 - 47.1		
		7 9 14	S9 (4)	47.1 48.5		Very stiff gray silty CLAY with fine sand partings (CL)
50		P U S H	U1 (21)	50.0 - 52.0		
		5 6 9	S10 (18)	52.0 - 53.5		Very stiff to stiff gray silty CLAY with fine sand partings (CL)
55						
		4 5 7	S11 (18)	58.0 - 59.5		Stiff gray silty CLAY (CL)
60		P U S H	U2 (23)	60.0 - 62.0		
		2 4 6	S12 (18)	62.0 63.5		Stiff gray silty CLAY (CL)
65						
		4 5 5	NR (0)	68.0 - 69.5		No Recovery
70						

BORING NO. B114

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. 8114
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		P U S H	T2 (22)	70.0 - 72.0		
		6 5 6	S13 (18)	72.0 - 73.5		Stiff gray silty CLAY (CL)
75		P U S H	U3 (24)	75.0 - 77.0		(Gravel in clay at top of tube)
		7 5 5	S14 (18)	77.0 78.5		Stiff gray silty CLAY (CL)
80						
		WOR WOR 1	S15 (18)	83.0 - 84.5		Very soft gray silty CLAY (CL)
85		P U S H	U4 (24)	85.0 - 87.0		
		WOR/ 18"	S16 (18)	87.0 88.5		Very soft gray silty CLAY (CL)
90						
		WOR WOR 1	S17 (18)	93.0 - 94.5		Very soft gray silty CLAY (CL)
95		P U S H	T3 (24)	95.0 - 97.0		
		WOR/ 18"	S18 (18)	97.0 - 98.5		Very soft gray silty CLAY (CL)
100		P U S H	U5 (24)	100.0 - 102.0		
		WOR WOR 1	S19 (18)	102.0 103.5		Very soft gray silty CLAY (CL)
105						
		WOR/ 18"	S20 (18)	108.0 - 109.5		Very soft gray silty CLAY (CL)
110						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B114
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		P U S H	U6 (24)	110.0 - 112.0		
115		4 5 4	S21 (18)	114.5 - 116.0		Stiff gray silty CLAY (CL)
120		4 5 8	S22 (10)	119.0 - 120.5		Stiff gray silty CLAY (CL)
					121.0	
125		27 42 53	S23 (12)	124.0 - 125.5		Very dense gray coarse to fine sandy SILT, trace fine gravel (ML-SM) - GLACIAL TILL -
						TOP OF BOULDER ZONE
					129.5	
130		5* 4 3 2 2	C1 (4)	129.5 - 134.5		Very dense gray coarse to fine sandy SILT, trace gravel with cobbles and boulders (ML-SM) - GLACIAL TILL -
135			ROLLER BIT (0)	134.5 - 139.0		
					136.0	Very soft, completely to very severely weathered, gray aphanitic ARGILLITE.
		** 100/1	S24 (1)	139.0- 139.1		
140					140.0	
145						
150						

*Cored Boulder in Till with NX core barrel. Numbers are drilling rate in minutes per foot

** Used a 300-lb hammer

(See Core Boring Report, page 5)

BORING NO. B114

HALEY & ALDRICH, INC.
CAMBRIDGE MASSACHUSETTS

CORE BORING REPORT

BORING NO. B114
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
135							
	8	139.1 C2 140.0	0	0		140.0	No Recovery
140	6	140.0	45	75			
	4				SLIGHT		
	3	C 3			to		Medium hard, slightly to moderately weathered, sound to moderately fractured, gray, aphanitic ARGILLITE; close to moderately close, open, shallow to steeply dipping, smooth joints; bedding steeply dipping to vertical.
	3				MODERATE		
	3	145.0	20	33			
145	8	145.0	52	86			
	7				SLIGHT		
	6	C 4			to		
	6				MODERATE		
	7	150.0	20	33			
150							Bottom of Exploration 150.0 ft
155							

BORING NO. B114

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B115

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 3
LOCATION	See Plan
ELEVATION	16.4
DATUM	Boston City Base
START	23 Sept 1985
FINISH	25 Sept 1985
DRILLER	M. Fisher
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	-
INSIDE DIAMETER (IN)	4/3	1-3/8/2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	*All samples designated with an "A" taken with a 2-inch I.D. split spoon for environmental assessment

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	2 7	13 17 26 18	S1A (14)	0.0 - 2.0		Hard gray coarse to fine sandy SILT, some gravel, little brick - FILL -
	25 37	19 30 27 52	S1 (10)	2.0 - 4.0		Hard gray coarse to fine sandy SILT, some gravel, little brick, cinders - FILL -
5	28 10	12 25 105 81	S2A (12)	4.5 - 6.5		Hard gray-brown coarse to fine sandy SILT, some gravel, little brick - FILL -
	262 65	55 13 16 25	S2 (10)	6.5 - 8.5		Medium dense gray coarse to fine SAND, little gravel, little silt, little brick - FILL -
	16					
10	10 8	5 5 4 4	S3A (6)	9.5 - 11.5		Stiff black-gray SILT, little coarse to fine sand, clay, gravel, oil - FILL -
	7 9	4 5 4 4	S3 (10)	11.5 - 13.5		Stiff black-gray SILT, little coarse to fine sand, clay, gravel, oil - FILL -
	10					
15	9 21	2 2 1 3	S4A (20)	14.5 - 16.5		Soft mottled black-gray clayey SILT, little fine sand, organics, trace shells - FILL -
	14 15	WOR 2 3 3	S4 (16)	16.5 - 18.5		Medium stiff light brown-black clayey SILT, little fine sand, little organics - FILL -
	14					
20	14 33	3 11 5 5	S5A (18)	19.5 - 21.5		Very stiff dark gray coarse to fine sandy SILT, little gravel, trace brick - FILL -
	26 27	1 3 4 10	S5 (16)	21.5 - 23.5		Medium stiff brown-gray clayey SILT, little coarse to fine sand, little gravel - FILL -
	23					
25	17 30	6 5 5 4	S6A (14)	24.5 - 26.5	26.5	Stiff gray coarse to fine sandy SILT, little gravel - FILL -
	28 26	1 5 5 8	S6 (24)	26.5 - 28.5		Stiff gray ORGANIC SILT, little fine sand, trace shells, trace gravel - FILL -
	27					
30	27	4	S7A	29.5 - 31.5		

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO:		
			BOTTOM OF CASING	BOTTOM OF HOLE	WATER
25 Sept 1985	9:30	0.5 hr	40.0	76.0	22.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON

SUMMARY

OVERBURDEN (LIN FT)	76.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	16S, 8AS

BORING NO. B115

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B115
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	40	3 5 5	S7A (20)	29.5 - 31.5		Stiff dark gray-brown ORGANIC SILT, little gravel, little fine sand, trace shells - FILL -
	30 28	10 15 15 8	S7 (12)	31.5 - 33.5		Very stiff dark gray-brown ORGANIC SILT, little coarse to fine sand, gravel, (oily) - FILL -
	32				33.0	
35	26 33	6 9 17 19	S8A (17)	34.5 - 36.5		Very stiff mottled gray-yellow clayey SILT, little coarse to fine sand (oily), little gravel - FILL -
	32 29	11 10 13 15	S8 (14)	36.5 - 38.5		Very stiff mottled gray-yellow clayey SILT, partings of coarse to fine sand (oily) - FILL -
	41				39.5	
40	37 41	11 12 10	S9 (16)	39.5 - 41.0		Dense gray fine SAND
	52 66 73					- FILL -
45	82 61	16 10 10	S10 (8)	44.5 46.0		Very stiff gray-black coarse to fine sandy SILT, little clay, trace gravel, trace brick - FILL -
	56 57 59				47.0	
50	62	5 4 7	S11 (10)	49.5 - 51.0		Stiff black ORGANIC SILT, little wood (oily) - FILL -
					53.0	
55		3 5 7	S12 (5)	54.5 - 56.0	56.0	Stiff gray organic clayey SILT, little fine sand, trace wood - FILL -
60		2 3 5	S13 (18)	59.6 - 61.0		Medium stiff to stiff gray silty CLAY (CL)
65		3 5 7	S14 (18)	64.5 - 66.0		Stiff gray silty CLAY (CL)
70		3	S15 (18)	69.5 - 71.0		Stiff gray silty CLAY (CL)

BORING NO. B115

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B115
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		6 8	S15 (18)	69.5 - 71.0		Stiff gray silty CLAY (CL)
75		3 4 6	S16 (18)	74.5 - 76.0		Stiff gray silty CLAY (CL)
						Bottom of Exploration 76.0 ft
80						

BORING NO. B115

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	**TEST BORING REPORT**	**BORING NO.** B116

PROJECT	Boston Fan Pier, Boston, Massachusetts	**FILE NO.** 5556
CLIENT	HBC Associates, Boston, Massachusetts	**SHEET NO.** 1 **OF** 5
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island	

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NX
INSIDE DIAMETER (IN)	4/3	1-3/8	2-1/8
HAMMER WEIGHT (LB)	Dilled	140	Split-
HAMMER FALL (IN)	in	30	liner

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE Truck mounted CME-55
BIT TYPE Roller Bit
DRILL MUD None
OTHER

LOCATION See Plan
ELEVATION 15.6
DATUM Boston City Base
START 4 Oct 1985
FINISH 8 Oct 1985
DRILLER G. Brouilette
H&A REP R. Heath

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		36 23 17	S1 (6)	0.0 - 1.5		Dense brown silty coarse to fine SAND, little gravel, trace brick - FILL - (Granite blocks 1.5 ft - 4.0 ft)
					4.0	
5		4 2 5 1	S2 (6)	4.0 - 6.0		Stiff gray SILT, little coarse to fine sand, trace gravel - FILL -
10		1 2 1 1	S3 (18)	9.0 - 11.0		Soft gray-black fine sandy SILT - FILL -
					12.0	
15		1 1 1 1	S4 (24)	14.0 - 16.0		Very loose gray fine SAND, little silt - FILL -
					17.0	
20		1 3 2 5	S5 (24)	19.0 - 21.0		Medium stiff gray-black fine sandy ORGANIC SILT, trace shells, trace peat fibers (ML-SM)
					23.0	
25		9 9 14 16	S6 (18)	24.0 - 26.0		Medium dense brown silty fine SAND (SM)
					27.0	
30		7 8	S7 (24)	29.0 - 31.0		Stiff gray clayey SILT, with fine sand partings (MH)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
7 Oct 1985	6:30	50	24.0	21.0	5.0
	Installed Observation Well				

SAMPLE IDENTIFICATION

O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
S SPLIT SPOON
WOR Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	144.0 ft
ROCK CORED (LIN FT)	10.0 ft
SAMPLES	29S, 2C

BORING NO. B116

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B116
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		6 6	S7 (24)	29.0- 31.0		Stiff gray clayey SILT with fine sand partings (MH)
					32.0	--
35		6 6 7 7	S8 (24)	34.0 - 36.0		Stiff gray silty CLAY with fine sand partings (CL)
40		8 9 12 9	S9 (24)	39.0 - 41.0		Very stiff gray silty CLAY with fine sand layers (CL-SP)
45		2 3 2 3	S10 (24)	44.0 - 46.0		Medium stiff gray silty CLAY with one fine sand layer (CL)
50		1 2 4 4	S11 (24)	49.0 - 51.0		Medium stiff gray silty CLAY, with fine sand partings (CL)
55		2 2 3 5	S12 (24)	54.0 - 56.0		Medium stiff gray silty CLAY with occasional fine sand partings (CL)
60		1 2 3 4	S13 (24)	59.0 - 61.0		Medium stiff gray silty CLAY with occasional fine sand partings (CL)
65		1 1 2 4	S14 (24)	64.0 - 66.0		Soft gray silty CLAY (CL)
70		WOR WOR	S15 (24)	69.0 - 71.0		Very soft gray silty CLAY (CL)

BORING NO. B116

TEST BORING REPORT

BORING NO. B116
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		WOR WOR	S15 (24)	69.0- 71.0		Very soft gray silty CLAY (CL)
75		WOR/ 24"	S16 (24)	74.0 - 76.0		Very soft gray silty CLAY (CL)
80		1 2 3 4	S17 (24)	79.0 - 81.0		Medium stiff gray silty CLAY (CL)
85		WOR/ 24"	S18 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
90		WOR/ 24"	S19 (24)	89.0 - 91.0		Very soft gray silty CLAY (CL)
95		WOR/ 24"	S20 (24)	94.0 - 96.0		Very soft gray silty CLAY (CL)
100		WOR/ 24"	S21 (24)	99.0 - 101.0		Very soft gray silty CLAY (CL)
105		WOR/ 24"	S22 (24)	104.0 - 106.0		Very soft gray silty CLAY (CL)
110		WOR WOR	S23 (24)	109.0 - 111.0		Very soft gray silty CLAY (CL)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B116
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		WOR WOR	S23 (24)	109.0- 111.0		Very soft gray silty CLAY (CL)
115		WOR/ 24"	S24 (24)	114.0 - 116.0		Very soft gray silty CLAY (CL)
120		WOR/ 24"	S25 (24)	119.0 - 121.0		Very soft gray silty CLAY (CL)
125		WOR/ 24"	S26 (24)	124.0 - 126.0		Very soft gray silty CLAY (CL)
130		WOR WOR	S27A (12)	129.0 - 130.0	130.0	Very soft gray silty CLAY (CL)
		17 19	S27B (4)	130.0 - 131.0		Hard gray silty CLAY, little fine gravel, trace sand (CL-GP) - GLACIAL TILL -
					133.0	
135		22 32 28	S28 (6)	134.0 - 135.5		Completely to very severely weathered, gray, aphanitic ARGILLITE.
140		100/2"	S29 (2)	139.0 - 139.1		Completely to very serverely weathered, gray, aphanitic ARGILLITE.
					144.0	(See Core Boring Report, page 5)
145						

BORING NO. B116

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B116
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						144.0	
	5	144.0	48	80	MODERATELY SEVERE to VERY SEVERE		Medium to soft, moderately severe to very severely weathered, moderately to severely fractured gray, aphanitic ARGILLITE, close to very close, open, vertical to moderately dipping, smooth joints, steeply dipping bedding with some calcite filling.
145	5						
	4	C 1					
	5						
	5	149.0	-	-			
	5	149.0	34	56	SEVERE to COMPLETELY		Soft to very soft, severe to completely weathered, severely fractured, gray, aphanitic ARGILLITE; close to very close, open, vertical to moderately dipping, smooth joints; steeply dipping bedding.
150	6						
	5	C 2					
	5						
	5	154.0	-	-			
155							Bottom of Exploration 154.0 ft

Notes:

1. Observation well installed in completed borehole. Refer to installation report for details.
2. RQD not calculated due to severity of weathering.

BORING NO. B116

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B117

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	15.3
DATUM	Boston City Base
START	9 Oct 1985
FINISH	11 Oct 1985
DRILLER	G. Brouilette
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NX
INSIDE DIAMETER (IN)	4/3	1-3/8	2-1/8
HAMMER WEIGHT (LB)	Drilled	140	Split-
HAMMER FALL (IN)	in	30	liner

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck mounted CME-55
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	Cobblestones
		9 10 9 9	S1 (18)	0.5 - 2.5		Medium dense light to dark brown, coarse to fine SAND, little silt, trace gravel. - FILL -
5		2 2 2 2	S2 (12)	4.0 - 6.0		Soft to medium stiff gray-black fine sandy SILT, trace shells - FILL -
10		5 3 2 3	S3 (12)	9.0 - 11.0		Medium stiff gray SILT, little fine sand, little gravel - FILL -
15		3 3 7 7	S4 (12)	14.0 - 16.0		Loose to medium dense black silty coarse to fine SAND with wood (oily) - FILL -
20		1 1 1 3	S5 (24)	19.0 - 21.0		Very loose gray fine SAND, little silt, trace clay, trace shells - FILL -
25		9 6 7 4	S6 (4)	24.0 - 26.0		Medium dense black-gray coarse SAND (Probable washed sample) - FILL -
					27.0	
		4	S7 (6)	29.0 - 29.5	29.5	Medium stiff gray ORGANIC SILT, trace sand, shells (OL)
30		9	S7B (18)	29.5 - 31.0		Very stiff gray clayey SILT (MH)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
10 Oct	6:30	2	30.0	81.0	13.0
11 Oct	6:15	24	134.0	139.0	13.0
11 Oct 1985	11:00	29	10.0	144.0	7.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	139.0 ft
ROCK CORED (LIN FT)	5.0 ft
SAMPLES	28S, 1C

BORING NO. B117

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B117
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		10 11	S7B (18)	29.5- 31.0		Very stiff gray clayey SILT (MH)
					33.0	
35		9 11 8 10	S8 (24)	34.0 - 36.0		Medium dense gray fine SAND, with clayey silt laminae. (SM-MH)
					37.0	
40		5 6 5 7	S9 (24)	39.0 - 41.0		Stiff gray silty CLAY with fine sand partings (CL)
45		2 3 6 6	S10 (24)	44.0 - 46.0		Stiff gray silty CLAY, trace fine sand partings (CL)
50		2 3 3 4	S11 (24)	49.0 - 51.0		Medium stiff gray silty CLAY (CL)
55		2 2 3 4	S12 (24)	54.0 - 56.0		Medium stiff gray silty CLAY (CL)
60		2 4 5 4	S13 (24)	59.0 - 61.0		Medium stiff gray silty CLAY, trace fine sand partings (CL)
65		2 2 4 4	S14 (24)	64.0 - 66.0		Medium stiff gray silty CLAY (CL)
70		2 4	S15 (24)	69.0 - 71.0		Medium stiff gray silty CLAY (CL)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B117
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		3 5	S15 (24)	69.0- 71.0		Medium stiff gray silty CLAY (CL)
75		WOR WOR 2 3	S16 (24)	74.0 - 76.0		Very soft to soft gray silty CLAY (CL)
80		WOR WOR 4 5	S17 (24)	79.0 - 81.0		Soft to medium stiff gray silty CLAY (CL)
85		WOR/ 24"	S18 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
90		WOR/ 24"	S19 (24)	89.0 - 91.0		Very soft gray silty CLAY (CL)
		WOR 18	S20 (12)	94.0 - 95.0		Hard gray silty CLAY (CL)
95		15 19	S20B (6)	95.0 - 96.0	95.0	Very dense coarse to fine SAND, trace silt (SW) - GLACIAL OUTWASH -
100		18 21 25 30	S21 (24)	99.0 - 101.0		Dense gray medium to fine SAND (SP) - GLACIAL OUTWASH -
105		28 36 40 59	S22 (12)	104.0 - 106.0		Very dense gray gravelly coarse to fine SAND, trace silt with layers of fine sand (SW) - GLACIAL OUTWASH -
110		29 39	S23 (12)	109.0 - 111.0		Very dense gray gravelly coarse to fine SAND, little silt with layers of fine sand (SM)

BORING NO. B117

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B117
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		44 69	S23 (12)	- 111.0		Very dense gray gravelly coarse to fine SAND, little silt with layers of fine sand (SM) - GLACIAL OUTWASH -
					113.0	
115		47 37 31	S24 (18)	114.0 - 115.5		Very dense gray coarse to fine sandy SILT, little gravel (ML-SM) - GLACIAL TILL -
120		76 110	S25 (12)	119.0 - 120.0		Very dense gray coarse to fine SAND, little gravel, little silt (SM) - GLACIAL TILL -
					123.0	
125		42 45 72	S26 (18)	124.0 - 125.5		Very severely weathered, gray-brown, very coarse to fine grained ARKOSIC SANDSTONE. (Silty coarse to fine SAND, little fine gravel, trace clay)
130		100/1"	S27 (1)	129.0 - 129.1		Very severely weathered, light brown, coarse to fine grained ARKOSIC SANDSTONE. (Silty coarse to fine SAND, trace clay)
135		100/1"	S28 (1)	134.0 - 134.1		Very severely weathered, light brown, coarse to fine grained ARKOSIC SANDSTONE. (Silty coarse to fine sand, trace clay)
					139.0	
140						(See Core Boring Report, page 5)
						Bottom of Exploration at 144.0 ft.
145						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B117
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY RQD IN.	RECOVERY RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						139.0	- - - - - - - - - - - - - - - - - - - -
	6	139.0	54	90			
140	7						Moderately hard, moderately weatherd, slightly fractured to sound, light brown medium to coarse grained ARKOSIC SANDSTONE; close, open, low angle to moderately dipping (5°-55°), smooth joints.
	7	C 1			MODERATE		
	7						(143.2 ft - 143.7 ft - extremely fractured)
	6	144.0	33	55			
145							Bottom of Exploration 144.0 ft

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B118

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc. E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	15.8
DATUM	Boston City Base
START	1 Oct 1985
FINISH	2 Oct 1985
DRILLER	M. Fisher
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW	S	NXD3
INSIDE DIAMETER (IN)	4	1-3/8	2-1/8
HAMMER WEIGHT (LB)	300	140	Split-
HAMMER FALL (IN)	24	30	liner

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig
BIT TYPE	Roller Bit
DRILL MUD	
OTHER	

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	47	8 9	S1 (6)	0.0 - 1.5		Medium dense brown coarse to fine SAND, little gravel, trace silt
	58	11				
	38					
	44					- FILL -
	54					
5	12	1* 1*	S2 (3)	5.0 - 6.5		Brown coarse to fine SAND, trace silt (wet) *(300-lb hammer used to get by obstruction)
	7	1*				
	2					- FILL -
	3					
	4					
10	6	5 4	S3 (18)	10.0 - 11.5		Medium stiff gray-black fine sandy SILT, trace peat
	8	4				
	7					
	7					- FILL -
	8					
15	9	7 2	S4 (2)	15.0 - 16.5		Loose gray coarse to fine SAND, trace silt
	8	4				
	15					- FILL -
	14					
	22	4	S5 (2)	19.5 - 21.0		Loose gray coarse to fine SAND, trace silt
20	19	4 3				
	36					- FILL -
	43				22.5	
	38					
	15	4	S6 (14)	24.5 - 26.0		
25	16	5 12				Medium dense mottled gray-yellow silty fine SAND, trace clay (SM)
	88				27.0	
	61					
	59					
	180	17	S7 (18)	29.5 - 31.0		Very stiff mottled gray-yellow clayey SILT, little fine sand (MH)
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
	Installed Observation Well				

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	124.0 ft
ROCK CORED (LIN FT)	10.0 ft
SAMPLES	24S, 5U, 3T, 2C

BORING NO. B118

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B118
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	110	13 15	S7 (18)	29.5 - 31.0		Very stiff mottled gray-yellow clayey SILT, little fine sand (MH)
35		4 6 9	S8 (18)	34.5 - 36.0		Very stiff to stiff gray fine sandy SILT, little clay (MH-SM)
40		11 5 5	S9 (17)	39.5 - 41.0		Stiff, gray clayey SILT, some fine sand with fine sand partings (MH-SM)
					42.0	------------------------------
45		3 4 4	S10 (18)	44.5 - 46.0		Stiff to medium stiff gray silty CLAY with fine sand layers (CL-SP)
50		P U S H	U1 (24)	50.0 - 52.0		
		4 6 7	S11 (18)	52.0 - 53.5		Stiff gray silty CLAY with fine sand layers (CL-SP)
55		P U S H	T1 (27)	55.0 - 57.2		
		6 4 5	S12 (18)	57.2 58.6		Stiff gray silty CLAY (CL)
60		P U S H	U2 (24)	60.0 - 62.0		
		2 2 5	S13 (18)	62.0 - 63.5		Medium stiff gray silty CLAY (CL)
65						
		WOR 3 6	S14 (18)	68.0 - 69.5		Stiff gray silty CLAY (CL)
70						

TEST BORING REPORT

BORING NO. B118
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		P U S H	U3 (22.5)	70.0 - 72.0		
		9 6 7	S15 (18)	72.0 - 73.5		Stiff gray silty CLAY (CL)
75		P U S H	T2 (24)	75.0 - 77.0		
		4 4 5	S16 (18)	77.0 78.5		Stiff gray silty CLAY (CL)
80		P U S H	U4 (24)	80.0 - 82.0		
		WOR 5 6	S17 (18)	82.0 - 83.5		Stiff gray silty CLAY (CL)
85						
		WOR WOR 3	S18 (18)	87.0 - 88.5		Soft gray silty CLAY (CL)
90						
		P U S H	U5 (24)	91.5 - 93.5		
		WOR/ 18"	S19 (18)	93.5 95.0		Very soft gray silty CLAY (CL)
95		P U S H	T3 (23)	95.0 - 97.0		
		WOR 3 5	S20 (18)	99.0 - 100.5		Medium stiff gray silty CLAY (CL)
100						
		WOR 3 3	S21 (18)	104.0 - 105.5		Medium stiff silty CLAY (CL)
105						
					108.5	
110		24 34	S22 (10)	109.0 - 110.5		Hard gray coarse to fine sandy SILT, trace gravel

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B118
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		58	S22 (10)	- 110.5		Hard gray coarse to fine sandy SILT, trace gravel (ML-SM) - GLACIAL TILL -
		130/6"	NR	114.0 - 114.5		
115		20* 23* 19*	S23 (8)	114.5 - 116.0		Hard gray fine sandy SILT, little fine gravel *(300-lb hammer) (ML-SM) - GLACIAL TILL -
					117.0	
120		12* 17* 25*	S24 (6)	119.5 - 121.0		Completely to very severely weathered, gray, aphanitic ARGILLITE *(300-lb hammer)
					124.0	
125						(See Core Boring Report, page 5)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. 8118
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY RQD IN.	RECOVERY RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						124.0	
	8	124.0	30	50			
125	8				COMPLETE to SEVERE		Very soft very severely to completely weathered, moderately fractured to sound, gray, aphanitic ARGILLITE; close, open, smooth joints.
	8	C 1					
	8						
	8	129.0	-	-			
	6	129.0	54	90			
130	5				MODERATELY SEVERE to SEVERE		Soft, moderately severe to severe weathered, extremely fractured to sound, gray, aphanitic ARGILLITE, very close to close, open, smooth joints. (130.8 ft - 130.9 ft clay seam)
	5	C 2					
	6						
	5	134.0	-	-			
135							Bottom of Exploration 134.0 ft

Notes:

1. Observation well installed in completed borehole. Refer to installation report for details.
2. RQD not calculated due to severity of weathering.

BORING NO. 8118

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B119

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 3
LOCATION	See Plan
ELEVATION	15.9
DATUM	Boston City Base
START	25 Sept 1985
FINISH	30 Sept 1985
DRILLER	M. Fisher
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	NW	S	-
INSIDE DIAMETER (IN)	3	1-3/8/2*	-
HAMMER WEIGHT (LB)	800	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	*All samples designated with an "A" taken with a 2-inch I.D. split spoon for environmental assessment

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	17	31	S1A	0.0 -		Very dense brown coarse to fine gravelly SAND, little brick, trace silt
		75	(20)			
	40	87				
		98		2.0		- FILL -
	36	15*	S1	2.0 -		Very dense dark brown silty coarse to fine SAND, little gravel, trace brick
		11*	(6)			
	18	15*				
		20*		4.0		*(Used 300-lb hammer)
	9					- FILL -
5		7	S2A	4.5 -		Very stiff gray silty CLAY, little coarse to fine sand, little brick, trace gravel
	23	10	(10)			
		10				
	22	36		6.5		- FILL -
		12	S2	6.5		Very stiff brown-gray silty CLAY, little coarse to fine sand, brick, trace gravel
	19	10	(8)			
		11				
	16	16		8.5		
						- FILL -
	29					
10		2	S3A	9.5		
	26	3	(16)			Stiff brown-gray silty CLAY, little coarse to fine sand with wood
		7				
	25	8		11.5		- FILL -
		2	S3	11.5 -		
	13	2	(12)			Medium stiff brown-gray silty CLAY, little coarse to fine sand with wood
		5				
	26	3		13.5		
	18					- FILL -
15		3	S4A	14.5 -		
	26	5	(4)			Stiff gray clayey SILT, some coarse to fine sand, little gravel, trace shells
		5				
	30	5		16.5		- FILL -
		3	S4	16.5 -		
	33	3	(18)			Stiff gray clayey SILT, some coarse to fine sand, little gravel, trace brick
		7				
	24	6		18.5		
	25					- FILL -
20						
	30	8	S5A	19.5 -		
		11	(6)			Very stiff gray silty CLAY, little coarse to fine sand, little wood, trace gravel
	30	8				
		8		21.5		
	48	2	S5	21.5 -		- FILL -
		4	(12)			Stiff gray silty CLAY, little coarse to fine sand, little wood, trace gravel
	300+	8				
		14		23.5		
	32					- FILL -
25						
	26					(Wood 24.5 ft - 25.5 ft)
					26.0	
	28	3	S6A	26.0 -		
		4	(20)			Medium stiff black ORGANIC SILT, little coarse to fine sand, little gravel, little wood, trace brick (oily)
	35	3				
		4		28.0		
	16	1	S6	28.0 -		- FILL -
		3	(16)			
	33	4				
30		2		30.0		

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
30 Sept 1985	13:29	0.25	20.0	71.5	13.7

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON

SUMMARY

OVERBURDEN (LIN FT)	71.0 ft
ROCK CORED (LIN FT)	0.5 ft
SAMPLES	14S, 8AS

BORING NO. B119

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. 8119
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	37 36	1 2 1 2	S7A (8)	30.0 32.0		Soft gray-black silty CLAY, little organics, trace wood, trace coarse to fine sand (oily) - FILL -
	37 24	1 2 3 4	S7 (12)	32.0 34.0		Medium stiff gray-black silty CLAY, little organics, trace wood - FILL -
35	45 62	5 4 8 4	S8A (12)	34.5 36.5		Stiff gray-black silty CLAY, little organics, little coarse to fine sand, little gravel, trace brick and wood - FILL -
	65 71 54	4 5 8 7	S8 (14)	36.5 38.5		Stiff gray-black silty CLAY, little organics, little coarse to fine sand, little gravel, trace brick and wood - FILL -
40	52 67	5 6 8	NR (0)	39.5 41.0		No Recovery
	385/4"					(Roller bit through boulder 42.5 ft - 43.5 ft)
			CORE	43.5 44.0		(Cored 43.5 ft - 44.0 ft)
45		3 4 5	S9 (18)	44.0 45.5		Stiff black ORGANIC SILT, trace wood, trace brick - FILL -
					48.0	
50		8 8 7	S10 (18)	50.0 51.5		Very stiff to stiff gray silty CLAY (CL)
55		6 7 8	S11 (18)	55.0 56.5		Very stiff to stiff gray silty CLAY with fine sand partings (CL)
60		3 5 6	S12 (18)	60.0 61.5		Stiff gray silty CLAY with fine sand partings (CL)
65		2 4 4	S13 (18)	65.0 66.5		Stiff to medium stiff gray silty CLAY (CL)
70						

BORING NO. B119

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B119
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		6 9 8	S14 (18)	70.0 - 71.5		Very stiff gray silty CLAY (CL)
						Bottom of Exploration 71.5 ft.
75						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B120

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 5
LOCATION	See Plan
ELEVATION	16.3
DATUM	Boston City Base
START	24 Sept 1985
FINISH	26 Sept 1985
DRILLER	G. Brouilette
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	RW/NW	S	NX
INSIDE DIAMETER (IN)	4/3	1-3/8	2-1/8
HAMMER WEIGHT (LB)	Drilled	140	Split-
HAMMER FALL (IN)	in	30	liner

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck
BIT TYPE	Roller Bit
DRILL MUD	None
OTHER	Spun casing to depth of 24.0 ft

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		5 100	S1 (6)	0.0 - 1.0		Very dense brown coarse to fine SAND, little gravel trace silt, trace roots - FILL -
5						(Extremely difficult to penetrate FILL material. Possible GRANITE blocks.)
					9.0	
10		1 1 1 1	S2 (24)	9.0 - 11.0		Very soft to soft gray fine sandy SILT, little organics, trace gravel - FILL -
15		1 1	S3 (12)	14.0 - 15.0	15.0	Very soft to soft gray silty CLAY, trace fine sand -FILL-
		2 2	S3B (12)	15.0 - 16.0		Very loose to loose gray fine SAND, little silt, trace shells - FILL -
20		4 10 12 3	S4 (6)	19.0 - 21.0		Very stiff gray-black SILT, little coarse to fine sand, little clay, little gravel, trace brick - FILL -
					23.0	
25		10 14 15 12	S5 (4)	24.0 - 26.0		Medium dense mottled yellow-gray silty fine SAND (SM)
					27.0	
30		8 8	S6 (18)	29.0 - 31.0		(CL-SC) Very stiff gray silty CLAY, little fine sand

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
26 Sept 1985	6:50	14.0 hr	24.0	96.0	12.0
1 Oct 1985	10:00	0.5 hr	15.0	144.0	12.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	134.0 ft
ROCK CORED (LIN FT)	10.0 ft
SAMPLES	26S, 1T, 2C

BORING NO. B120

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B120
FILE NO. 5556
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		8 8	S6 (18)	29.0 - 31.0		Very stiff gray sitly CLAY, little fine sand (CL-SC)
					32.0	
35		6 6 7 10	S7 (18)	34.0 - 36.0		Stiff gray silty CLAY (CL)
40		7 8 13 14	S8 (18)	39.0 - 41.0		Very stiff gray silty CLAY, fine sand partings (CL)
45		1 2 4 6	S9 (24)	44.0 - 46.0		Medium stiff gray silty CLAY, fine sand partings (CL)
50		1 2 4 6	S10 (24)	49.0 - 51.0		Medium stiff gray silty CLAY, fine sand partings (CL)
		P U S H	T1 (20)	51.5 - 53.5		
55		1 2 4 6	S11 (24)	54.0 - 56.0		Medium stiff gray silty CLAY (CL)
60		1 2 4 5	S12 (24)	59.0 - 61.0		Medium stiff gray silty CLAY (CL)
65		1 2 2 3	S13 (24)	64.0 - 66.0		Medium stiff to soft gray silty CLAY (CL)
70		1 2	S14 (24)	69.0 - 71.0		Medium stiff gray silty CLAY (CL)

TEST BORING REPORT

BORING NO. B120
FILE NO. 5556
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		4 4	S14 (24)	69.0 - 71.0		Medium stiff gray silty CLAY (CL)
75		1 1 2 2	S15 (24)	74.0 - 76.0		Soft gray silty CLAY (CL)
80		WOR/ 12" 2 2	S16 (24)	79.0 - 81.0		Soft to very soft gray silty CLAY (CL)
85		WOR/ 12" 1 2	S17 (24)	84.0 - 86.0		Very soft gray silty CLAY (CL)
90		WOR/ 24"	S18 (24)	89.0 - 91.0		Very soft gray silty CLAY (CL)
95		WOR/ 24"	S19 (24)	94.0 - 96.0		Very soft gray silty CLAY (CL)
100		WOR/ 24"	S20 (24)	99.0 - 101.0		Very soft gray silty CLAY (CL)
105		WOR/ 24"	S21 (24)	104.0 - 106.0		Very soft gray silty CLAY (CL)
110		WOR/ 24"	S22 (24)	109.0 - 111.0		Very soft gray silty CLAY (CL)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B120
FILE NO. 5556
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		WOR/ 24"	S22 (24)	109.0 - 111.0		Very soft gray silty CLAY (CL)
115		WOR/ 24"	S23 (24)	114.0 - 116.0		Very soft gray silty CLAY (CL)
					118.0	
120		21 30 31 35	S24 (9)	119.0 - 121.0		Hard gray coarse to fine sandy SILT, little gravel (ML-SM) - GLACIAL TILL -
125		24 36 56	S25 (12)	124.0 - 125.5		Hard gray coarse to fine sandy SILT, little gravel - GLACIAL TILL - (ML-SM)
						Very dense gray silty coarse to fine SAND, little gravel - GLACIAL TILL - (SM)
		35	S26 (6)	129.0 - 129.5	129.5	
130		30 40	S26B (6)	129.5 - 130.5		Very soft, very severely to completely weathered, gray, aphanitic ARGILLITE
					134.1	
135		110/1"	NR	134.0- 134.1		No Recovery (See Core Boring Report, page 5)
140						

BORING NO. B120

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B120
FILE NO. 5556
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						134.0	
		134.0	36	60			
135	5						Very soft to soft, severely weathered, moderately fractured, gray, aphanitic ARGILLITE; very close to close, open, shallow to moderate (5°-55°) dipping, smooth joints, surfaces coated with calcite; steeply (55°-85°) dipping bedding.
	5				SEVERE		
	5	C 1					
	5						Bedrock weathered to clay 136.6 to 136.8 along open joint.
	5	139.0	-	-			
		139.0	48	80			
140	5						Very soft to soft, moderately severely to severely weathered, moderately fractured, gray, aphanitic ARGILLITE; very close to close, open, shallow to moderately dipping (5°-55°), smooth joints, joint surfaces coated with calcite; steeply dipping (55°-85°) bedding. Bedrock weathered to clay 142.3 to 142.6 along open joint.
	5				MOD.		
	5	C 2			SEVERE to		
	5				SEVERE		
	5	144.0	-	-			
145							Bottom of Exploration 144.0 ft
							Note: RQD not calculated due to severity of weathering.

BORING NO. B120

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B121

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 2
LOCATION	See Plan
ELEVATION	- 17.9
DATUM	Boston City Base
START	2 Oct 1985
FINISH	2 Oct 1985
DRILLER	K. Allen
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	BW	S	-
INSIDE DIAMETER (IN.)	2½	1 3/8	-
HAMMER WEIGHT (LB)	300	140	
HAMMER FALL (IN)	24	30	

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig on Raft
BIT TYPE	Choppping Bit
DRILL MUD	None
OTHER	Advanced BW casing to 15 ft., then open hole .

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	Weight	WOR/ 24"	S1	0.0 -		Very soft black ORGANIC SILT (OL)
	of			2.0		
	casing					
	to					
5	seven					
	feet					
		WOR/	S2 (6)	6.5	6.5	Very soft black ORGANIC SILT (OL)
	7	18"	S2B (10)	6.5 - 7.5	7.5	Very soft black fine sandy ORGANIC SILT, trace coarse sand (OL-SM)
	7	3	S2C (6)	8.0		Medium stiff mottled gray silty CLAY (CL)
10	10					
	10					
	14	1 2	S3 (20)	11.0 -		Soft to medium stiff gray silty CLAY, with occasional fine sand partings (CL)
	12	2 3		13.0		
	13	WOR	T1 (15)	13.5 -		Soft gray silty CLAY, with fine sand partings (CL)
15	10	1 2				
		2		15.5		NOTE: (Drove Shelby tube with 140-lb hammer falling 30 inches)
20		WOR/ 12"	S4 (18)	20.0 -		Very soft to soft gray silty CLAY (CL)
		2 2				
				22.0		
25		WOR/6" 1	S5 (22)	25.0 -		Very soft to soft gray silty CLAY (CL)
		1 1		27.0		
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
	Approximately 5.0 ft of Water				TIDAL

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	67.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	14S,2T

BORING NO. B121

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B121
FILE NO. 5556
SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		1 1 1 2	S6 (24)	30.0 - 32.0		Very soft to soft gray silty CLAY (CL)
35		WOR 2 2 2	S7 (14)	35.0 - 37.0		Medium stiff to soft gray silty CLAY (CL)
40		WOR 1 1 2	S8 (24)	40.0 - 42.0		Soft to very soft gray silty CLAY, trace gravel (CL)
45		WOR/ 12" 2 1	S9 (18)	45.0 - 47.0		Soft to very soft gray silty CLAY (CL)
50		WOR 2 2 3	S10 (24)	50.0 - 52.0		Medium stiff to soft gray silty CLAY (CL)
		WOR 2 3 2	T2 (18)	53.0 - 55.0		Medium stiff gray silty CLAY
55						NOTE: (Drove Shelby tube with 140-lb hammer falling 30 inches)
					59.5	
60		16 13 11 8	S11 (8)	60.0 - 62.0		Medium dense gray gravelly coarse to fine SAND, trace clay (SW) - GLACIAL OUTWASH -
					62.6	
65		13 15 18 22	S12 (12)	65.0 - 67.0		Dense gray silty medium to fine SAND, little coarse sand (SM) -GLACIAL TILL -
						Bottom of Exploration at 67.0 ft.
70						

BORING NO. B121

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B122

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 3
LOCATION	See Plan
ELEVATION	- 14.3
DATUM	Boston City Base
START	30 Sept 1985
FINISH	1 Oct 1985
DRILLER	K. Allen
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	BW	S	-
INSIDE DIAMETER (IN)	2½	1 3/8	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig on Raft
BIT TYPE	Chopping Bit
DRILL MUD	None
OTHER	Advanced BW casing to 12 ft., then open hole.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	Weight	WOR/ 12"	S1 (10)	0.0 - 1.0	1.0	Very soft black ORGANIC SILT, trace fine SAND (OL)
	of	1 1	S1B (14)	1.0 - 2.0		Very loose black organic silty fine SAND - FILL -
	casing					
	↓					
5	3	24 *	S2 (9)	5.0 - 7.0		Hard gray ORGANIC SILT, little to trace fine sand - FILL - *(Used 300-lb hammer)
	3	* 3/18" *				(High blow count due to boulder in organics)
	10					
	13					
	1	1 1	S3 (4)	9.0 - 10.0		Very loose gray fine sandy GRAVEL, little organic silt - FILL -
10	1					
	2					NOTE: (Obstruction encountered at 10 ft., relocated hole slightly.)
	3				12.5	
	4					
	4					
15	3	1/ 24"	S4 (24)	14.5 - 16.5		Very soft gray silty CLAY, with occasional fine sand partings (CL)
	4					
	4					
		WOR/	S5 (24)	19.5 - 21.5		
20		WOH 1				Very soft gray silty CLAY (CL)
		1				
		WOR/ 12"	T1 (22)	22.5 - 24.5		Very soft gray silty CLAY (CL)
		1 2				
25						NOTE: (Drove Shelby tube with 140-lb hammer falling 24 inches)
		WOR/ 12"	S6 (24)	29.0 - 31.0		Very soft gray silty CLAY (CL)
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
	Approximately 8.0 ft of water				TIDAL

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods
WOH	Weight of Hammer

SUMMARY

OVERBURDEN (LIN FT)	75.5 ft
ROCK CORED (LIN FT)	-
SAMPLES	14S, 2T

BORING NO. B122

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B122
FILE NO 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		1/ 12"	S6 (cont) (24)	29.0 - 31.0		Very soft gray silty CLAY (CL)
35		1/ 18" 1	S7 (24)	34.0 - 36.0		Very soft gray silty CLAY (CL)
40		WOR/ 24"	S8 (16)	39.0 - 41.0		Very soft gray silty CLAY (CL)
45		WOR/ 12" 1/ 12"	S9 (24)	44.0 - 46.0		Very soft gray silty CLAY (CL)
50		WOR/ 12" 1 1	S10 (24)	49.0 - 51.0		Very soft gray silty CLAY (CL)
		WOR/ 12" 2 2	T2 (22)	52.0 - 54.0		NOTE: (Drove Shelby tube with 140-lb hammer)
55						
60		WOR/ 12" 2 3	S11 (24)	59.0 - 61.0		Very soft to soft gray silty CLAY (CL)
65		WOR 4 7 5	S12 (24)	64.0 - 66.0		Stiff gray silty CLAY, with frequent fine sand partings (CL)
					68.1	
70		9 14 12 11	S13 (7)	68.5 - 70.5		Medium dense medium to fine SAND, little gravel, little silt, trace coarse sand (SM) - GLACIAL OUTWASH -

BORING NO. B122

TEST BORING REPORT

BORING NO. B122
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		11	S13(7)	-70.5	70.5	- GLACIAL OUTWASH -
		9	S14	73.5 -		Very stiff gray medium to fine sandy CLAY, little gravel, coarse sand, trace silt (bonded in-situ)
		14	(20)			
75		12				- GLACIAL TILL-
		11		75.5		
						Bottom of Exploration at 75.5 ft
80						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B123

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island
FILE NO.	5556
SHEET NO.	1 OF 2
LOCATION	See Plan
ELEVATION	- 30.2
DATUM	Boston City Base
START	23 Sept 1985
FINISH	23 Sept 1985
DRILLER	K. Allen
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	BW	S	-
INSIDE DIAMETER (IN)	2½	1 3/8	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE Skid Rig on Raft
BIT TYPE Chopping Bit
DRILL MUD None
OTHER Drove BW casing to 15 ft., then open hole to 57 ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		WOR/ 24"	S1 (10)	0.0 - 2.0		Very soft black ORGANIC SILT (OL)
5		WOR/ 18"	S2 (8)	5.0 - 6.0	6.0	Very soft black ORGANIC SILT (OL)
		2	S2B (12)	6.0 - 7.0		Soft gray silty CLAY, with occasional fine sand partings (CL)
10						
		2 3 2 3	S3 (24)	11.0 - 13.0		Medium stiff gray silty CLAY (CL)
		WOR/ 10" 2/ 14"	T1 (24)	13.5 - 15.5		Gray silty CLAY (CL)
15						NOTE: (Drove Shelby tube with 300-lb hammer falling 24 inches)
20		1 2 2 3	S4 (24)	20.0 - 22.0		Soft to medium stiff gray silty CLAY (CL)
25						
		2 3 2 4	S5 (24)	28.0 - 30.0		Medium stiff gray silty CLAY (CL)
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	WATER
	Approximately 7.0 ft of water				TIDAL

SAMPLE IDENTIFICATION

O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
S SPLIT SPOON
WOR Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	57.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	10S, 1T

BORING NO. B123

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B123
FILE NO. 5556
SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30						
35		1 2 2 2	S6 (24)	34.0 - 36.0		Soft to medium stiff, gray silty CLAY (CL)
40		2 2 3 2	S7 (24)	39.0 - 41.0		Medium stiff gray silty CLAY (CL)
45		2 3 3 3	NR	44.0 - 46.0		No Recovery
50					51.0	
		13 12 17 37	S8 (6)	51.0 - 53.0		Medium dense gray clayey GRAVEL, little fine sand, trace silt (bonded in-situ) - GLACIAL TILL - (GC)
55		18 40 44 31	S9 (10)	55.0 - 57.0		Very dense gray coarse to fine sandy GRAVEL, trace silt (well bonded in-situ) (GP) - GLACIAL TILL -
						Bottom of Exploration at 57.0 ft.
60						

BORING NO. B123

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO.	B124
FILE NO.	5556
SHEET NO.	1 OF 2
LOCATION	See Plan
ELEVATION	-24.2
DATUM	Boston City Base
START	24 Sept 1985
FINISH	24 Sept 1985
DRILLER	K. Allen
H&A REP	T.M. Cormican

PROJECT Boston Fan Pier, Boston, Massachusetts
CLIENT HBC Associates, Boston, Massachusetts
CONTRACTOR Guild Drilling Co., Inc., E. Providence, Rhode Island

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	BW	S	-
INSIDE DIAMETER (IN.)	2½	1 3/8	-
HAMMER WEIGHT (LB)		140	-
HAMMER FALL (IN)		30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig on Raft
BIT TYPE	Chopping Bit
DRILL MUD	None
OTHER	Casing settled under its own weight to 10 ft., then open hole to 62 ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		WOR/ 24"	S1 (16)	0.0 - 2.0		Very soft black ORGANIC SILT, with occasional fine sand partings (OL) NOTE: (Environmental sample, 3-in. tube from 0 to 5.5 ft Used 140-lb hammer. Recovered 55 inches.)
5		1 3 2 3	S2 (24)	5.0 - 7.0	5.0	Medium stiff gray silty CLAY (CL)
10						
		1 2 2 3	S3 (24)	11.0 - 13.0		Medium stiff to soft to stiff gray silty CLAY with occasional fine sand partings (CL)
		3/ 24"	T1 (19)	13.5 - 15.5		Gray silty CLAY (CL) NOTE: (Drove Shelby tube with 300-lb hammer.)
15						
20		WOR 1 2 3	S4 (18)	20.0 - 22.0		Soft gray silty CLAY, with occasional fine sand partings (CL)
25		WOR 1 3 3	S5 (18)	25.5 - 27.5		Medium stiff to soft gray silty CLAY, occasional seams of medium to fine sand. (CL)
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
	Approximately 6.5 ft of water				TIDAL

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	62.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	10S, 2T; Environmental Sample

BORING NO. B124

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B124
FILE NO. 5556
SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30						
		1 1 1 2	S6 (24)	31.5 - 33.5		Very soft to soft gray silty CLAY (CL)
35						
		1 2 2 3	S7 (24)	36.0 - 38.0		Soft to medium stiff gray silty CLAY (CL)
40						
		WOR 3 3 3	S8 (24)	43.0 - 45.0		Medium stiff gray silty CLAY (CL)
45		4/ 24"	T1 (24)	45.0 - 47.0		Gray silty CLAY (CL) NOTE: (Drove Shelby tube with 300-lb hammer falling 24 inches)
50						
					54.0	
55		14 16 54/4"- *20/2" *8	S9 (9)	54.0 - 56.0		Very dense gray coarse to fine sandy GRAVEL, little clay, trace silt (bonded in-situ) (GC) *(Used 300-lb hammer.) - GLACIAL TILL -
60		12 17 20 31	S10 (10)	60.0 - 62.0		Dense gray silty fine SAND, little gravel, trace coarse to medium sand, (well bonded in-situ) (SM) - GLACIAL TILL -
						Bottom of Exploration at 62.0 ft
65						

BORING NO. B124

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B125

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 2
LOCATION	See Plan
ELEVATION	-4.5
DATUM	Boston City Base
START	20 Sept 1985
FINISH	20 Sept 1985
DRILLER	K. Allen
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	BW	S	-
INSIDE DIAMETER (IN)	2½	1 3/8	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	18	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig on Raft
BIT TYPE	Chopping Bit
DRILL MUD	None
OTHER	Drove BW casing to 10 ft., then open hole to 34 ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		WOR/ /24"	S1 (7)	0.0 - 2.0		Very soft gray ORGANIC SILT, trace fine sand, shells (OL)
	1				2.0	
	4					NOTE: (Environmental sample, 3-inch tube from 0.0 to 5.5 ft., used 300-lb hammer)
	3					
5	3					
	6					
	6	4 6	S2 (17)	6.0 -		Medium dense stiff gray silty fine SAND interbedded with fine sandy SILT, occasional seams of gray silty clay, 2-inch layer of gray-brown medium to fine sand little silt. (SM-MH)
	9	6 8		8.0		
	14					
10	14					
					11.0	
		15 5	S3 (15)	12.0 -		Stiff gray silty CLAY with frequent seams of silt and occasional fine sand partings (CL)
		4 4		14.0		
15						
		3 2	S4 (24)	17.0 -		Medium stiff gray silty CLAY with occasional fine sand partings (CL)
		3 4		19.0		
20						
		1 1	S5 (16)	22.0 -		Medium stiff gray silty CLAY with one 6-inch layer of gray fine sand, occasional silt and fine sand partings (CL-SP)
		4 3		24.0		
25						
		1 2	S6 (22)	26.0 -		Soft to medium stiff gray silty CLAY (CL)
		2 1		28.0		
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
Approximately 10.0 ft of Water					TIDAL

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	34.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	7S;1 Environmental Sample

BORING NO. B125

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	TEST BORING REPORT	BORING NO. B125 FILE NO. 5556 SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30						
		2 1 2 3	S7 (24)	32.0 - 34.0		Soft gray silty CLAY, with occasional fine sand partings (CL)
						Bottom of Exploration at 34.0 ft.
35						

BORING NO. B125

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B126

PROJECT	Boston Fan Pier, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 2
LOCATION	See Plan
ELEVATION	-1.2
DATUM	Boston City Base
START	18 Sept 1985
FINISH	19 Sept 1985
DRILLER	K. Allen
H&A REP	R. Heath

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	NW	S	-
INSIDE DIAMETER (IN)	2½	1 3/8	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	24	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig on Raft
BIT TYPE	Chopping Bit
DRILL MUD	None
OTHER	Drove NW casing to 15-ft., then open hole to 30-ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	3	WOR/ /24"	S1 (24)	0.0 - 2.0		Very soft gray/green ORGANIC SILT, trace coarse to fine sand (OL) NOTE: (Environmental sample 3-inch tube, from 0.0 to 5.5 ft. Drove tube with 140-lb hammer, 60-inches recovery.)
	4					
	11					
	14				4.0	
	21					
5		4 2 1 1	S2 (8)	5.0 - 7.0		Very loose gray fine SAND, trace silt, shells (SP)
					8.0	
10		7 9 9	S3 -	10.0 - 11.5		Very stiff brown, fine sandy SILT (ML-SM)
					12.0	
		2 2 3 4	S4 (24)	13.5 - 15.5		Medium stiff gray silty CLAY, trace fine sand partings (CL)
15						
20		2 3 3 4	S5 (24)	20.0 - 22.0		Medium stiff gray silty CLAY (CL)
25		3 6 6 5	S6 (24)	25.0 - 27.0		Stiff gray silty CLAY, with occasional fine sand partings (CL)
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
Approximately 11.0 ft of Water					TIDAL

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	32.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	7S, 1 Environmental Sample

BORING NO. B126

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B126
FILE NO. 5556
SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		2 2 3 3	S7 (24)	30.0 - 32.0		Medium stiff gray silty CLAY, with occasional fine sand partings (CL)
						Bottom of Exploration at 32.0 ft.
35						

BORING NO. B126

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B127

PROJECT	BOSTON FAN PIER, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 3
LOCATION	See Plan
ELEVATION	- 14.7
DATUM	Boston City Base
START	25 Sept 1985
FINISH	25 Sept 1985
DRILLER	K. Allen
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	BW	S	-
INSIDE DIAMETER (IN.)	2½	1 3/8	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig on Raft
BIT TYPE	Chopping Bit
DRILL MUD	--
OTHER	Drove BW casing to 15 ft, then open hole to 70 ft

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	0	WOR 1	S1 (4)	0.0 - 1.0	1.0	Very soft black ORGANIC SILT. (OL)
	4	1 2	S1B (10)	1.0 - 2.0		Soft mottled yellow-blue silty CLAY. (CL)
	3					
	18					
	8					
5	13	2 2	S2 (18)	5.0 - 7.0		Soft gray silty CLAY, with frequent fine sand partings (CL)
	5	1 2				
	6	1 2	T1 (19)	7.0 - 9.0		Soft to medium stiff gray silty CLAY. (CL)
	6	2 3				
	10					NOTE: (Drove Shelby tube with 140-lb hammer falling 24 inches.)
10						
15		1 1 1 2	S3 (24)	14.0 - 16.0		Soft gray silty CLAY, with occasional fine sand partings. (CL)
20		1 2 2 2	S4 (24)	20.0 - 22.0		Soft to medium stiff gray silty CLAY. (CL)
25		1 2 2 3	S5 (24)	25.0 - 27.0		Soft to medium stiff gray silty CLAY. (CL)
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
	Approximately 6.0 ft of Water				TIDAL

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	72.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	13S, 2T

BORING NO. B127

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B127
FILE NO. 5556
SHEET NO. 2 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30						
		1 2 3 2	S6 (24)	31.0 - 33.0		Medium stiff gray silty CLAY (CL)
35						
		2 2 2 2	S7 (24)	37.0 - 39.0		Soft to medium stiff gray silty CLAY (CL)
40						
		2 2 2 1	S8 (24)	43.0 - 45.0		Soft to medium stiff gray silty CLAY (CL)
45		WOR/ 12" 1 1	T1 (24)	45.0 - 47.0		Very soft gray silty CLAY (CL) Note: (Tube rejected due to poor recovery.)
50		1 2 1 2	T2 (24)	50.0 - 52.0		Soft gray silty CLAY (CL) NOTE: (Drove Shelby tube with 140-lb hammer falling 24 inches)
55		WOR/ 12" 2 2	S9 (24)	55.0 - 57.0		Soft gray silty CLAY (CL)
60						
		1 2 3 10	S10 (24)	61.0 - 63.0	63.0	Medium stiff gray silty CLAY, trace gravel (CL)
65						
		27 10 13 21	S11 (8)	66.0 - 68.0		Medium dense gray silty medium to fine SAND, some gravel, trace coarse sand. (well bonded in-situ) (SM-GM) - GLACIAL TILL -
70						

BORING NO. B127

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B127
FILE NO. 5556
SHEET NO. 3 OF 3

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		23 16 10 13	S12 (9)	70.0 - 72.0		Medium dense gray gravelly coarse to fine SAND, little silt (well bonded in-situ). (SM-GM) - GLACIAL TILL-
						Bottom of Exploration at 72.0 ft.
75						

BORING NO. B127

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B128

PROJECT	BOSTON FAN PIER, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 2
LOCATION	See Plan
ELEVATION	- 27.7
DATUM	Boston City Base
START	26 Sept 1985
FINISH	26 Sept 1985
DRILLER	K. Allen
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	BW	S	-
INSIDE DIAMETER (IN)	2½	1 3/8	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	24	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Skid Rig on Raft
BIT TYPE	Chopping Bit
DRILL MUD	None
OTHER	Drove casing to 15 ft., then open hole to 61 ft

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	Weight	WOR/ 24"	S1 (13)	0.0 - 2.0		Very soft black ORGANIC SILT. (OL)
	of					
	casing					
	to					
	seven					
5	feet	WOR/ 24"	S2 (16)	5.0 - 7.0		Very soft black ORGANIC SILT. (OL)
					7.0	
	2					
	5					
	7					
10	7	1	S3 (24)	10.5 - 12.5		Soft gray silty CLAY. (CL)
	8	1 2				
	9	3				
	10					
	13					
15	14	1 2	S4 (24)	15.0 - 17.0		Soft to medium stiff gray silty CLAY, trace gravel. (CL)
	18	2 3				
		WOR/ 12"	T1 (21)	17.0 - 19.0		Gray silty CLAY. (CL) NOTE: (Drove Shelby tube with 140-lb hammer falling 24 inches)
		2 2				
20						
25		WOR 2 2 2	S5 (24)	25.0 - 27.0		Soft to medium stiff gray silty CLAY. (CL)
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
	Approximately 7.0 ft of Water				TIDAL

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	63.0 ft
ROCK CORED (LIN FT)	-
SAMPLES	11S,2T

BORING NO. B128

TEST BORING REPORT

BORING NO. B128
FILE NO. 5556
SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		2 2 2 2	S6 (24)	30.0 - 32.0		Soft to medium stiff gray silty CLAY. (CL)
35						
40		1 1 1 2	S7 (24)	40.0 - 42.0		Very soft to soft gray silty CLAY. (CL)
45						
		1 1 2 2	S8 (24)	45.5 - 47.5		Soft gray silty CLAY. (CL)
		WOR/ 24"	T2 (22)	48.0 - 50.0		Gray silty CLAY. (CL)
50						
55		2	S9 (6)	55.0 55.5		Soft to medium stiff gray silty CLAY. (CL)
		26 9 9	S9B (6)	55.5 - 57.0	55.5	Medium dense gray coarse to fine gravelly SAND, little clay (bonded in situ) (SC-GC) -GLACIAL TILL-
60						
		40 23 17 16	S10 (4)	61.0 - 63.0		Dense gray clayey medium to fine SAND, little gravel, coarse sand, trace silt (bonded in-situ) (SC) -GLACIAL TILL-
						Bottom of Exploration at 63.0 ft.
65						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B129

PROJECT	BOSTON FAN PIER, Boston, Massachusetts
CLIENT	HBC Associates, Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence Rhode Island

FILE NO.	5556
SHEET NO.	1 OF 4
LOCATION	See Plan
ELEVATION	16.9
DATUM	Boston City Base
START	29 Oct. 1985
FINISH	1 Nov. 1985
DRILLER	M. Fisher
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW	S	-
INSIDE DIAMETER (IN)	4	1-3/8/2*	-
HAMMER WEIGHT (LB)	300	140	-
HAMMER FALL (IN)	18	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE Hydraulic Skid Rig
BIT TYPE Roller Bit
DRILL MUD --
OTHER * All samples designated with an "A" were taken with a 2-inch I.D. split spoon fo

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	46	40 62	S1A (14)	0.0- 2.0		Very dense brown gravelly coarse to fine SAND, little silt - FILL -
	63	36 38				
	36	5 8	S1 (8)	2.0- 3.5		Medium dense brown silty fine SAND, little coarse to medium sand, trace red brick, with pockets of ash/cinder and blue silty clay. - FILL -
	21	10				
5	12					
	10	17 7	S2A (10)	5.0- 7.0		Medium dense gray silty medium to fine SAND, with frequent pockets of gray silty clay - FILL -
	7	6 5				
	7	1 1	S2 (1)	7.0- 8.5		Medium stiff gray silty CLAY, little medium to fine sand - FILL -
	11	4				
10	12					
	16	2 5	S3A (16)	10.0- 12.0		Medium dense gray silty CLAY, little medium to fine sand, trace gravel, coarse sand, with pockets of black organic silt - FILL -
	18	6 8				
	21	2 3	S3 (10)	12.0- 13.5		Loose gray clayey medium to fine SAND, trace coarse sand, red brick - FILL -
	27	4				
15	26					
	21	7 4	S4A (12)	15.0- 17.0		Loose gray silty medium to fine SAND, little clay trace coarse sand, wood - FILL -
	33	5 9				
	29	4 6	S4 (8)	17.0- 18.5		Very stiff gray silty CLAY, little medium to fine sand, trace coarse sand, red brick - FILL -
	57	10				
20	40					
	39	7 7	S5A (2)	20.0- 22.0		Medium dense gray clayey medium to fine SAND, little silt, trace coarse sand - FILL -
	41	12 11				
	48	5 8	S5 (5)	22.0- 23.5		Dense gray clayey medium to fine SAND, little gravel, trace coarse sand, silt - FILL -
	44	23				
25	41					
	40	12 7	S6A (18)	25.0- 27.0		Stiff gray silty CLAY, little fine sand, trace coarse to medium sand, shells, red brick, ash/cinder - FILL -
	41	7 6				
	46	3 5	S6 (16)	27.0- 28.5		Stiff gray fine sandy CLAY, little silt, medium sand, trace red brick - FILL -
	44	6				
30	47					

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
S SPLIT SPOON
WOR Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	116.5 ft
ROCK CORED (LIN FT)	--
SAMPLES	34S, 11AS

BORING NO. B129

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B129
FILE NO. 5556
SHEET NO. 2 OF 4

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	41 54	8 4 5 6	S7A (20)	30.0-32.0		Stiff mottled gray silty CLAY, little fine sand, trace coarse to medium sand, wood, red brick - FILL -
	59 57 58	4 6 7	S7 (18)	32.0-33.5		Stiff mottled gray silty CLAY, little medium to fine sand, trace coarse sand, red brick, wood - FILL -
35	58 63	12 10 10 9	S8A (4)	35.0-37.0		Medium dense gray clayey medium to fine SAND, little red brick, trace silt, wood - FILL -
	59 60 70	9 12 30	S8 (18)	37.0-38.5		Hard mottled gray silty CLAY, little medium to fine sand, trace coarse sand, red brick, wood, occasional layers of ash/cinders and brown silty fine SAND - FILL -
40	71 76	9 7 8 12	S9A (6)	40.0-42.0		Stiff to very stiff yellow-gray silty CLAY, little coarse to fine sand, gravel - FILL -
	94	5 10 12	NR	42.0-43.5		No Recovery
	78 81	7 16 15	NR	43.5-45.0		No Recovery (Made 2 attempts)
45	90	18 18 18	S10A (6)	45.0-46.2		Hard mottled yellow-gray silty CLAY, little medium to fine sand, trace coarse sand, gravel - FILL -
	84	61	S10B(10)	47.0		Very dense dark brown silty medium to fine SAND, little to trace gravel, trace coarse sand, wood, (faint organic odor) - FILL-
	80 89 121	7 19 18	S9 (2)	47.0-48.5		Hard mottled gray-yellow silty CLAY, trace medium to fine sand, with layer of dark brown silty fine sand - FILL -
50		9 8 5 7	S11A (16)	50.0-52.0	52.0	Very stiff gray silty CLAY - FILL- Stiff black ORGANIC SILT, trace medium to fine sand, ash/cinders - FILL -
		7 15 19	S10 (10)	52.0-53.5		Hard gray silty CLAY, with occasional fine sand partings (CL)
55		4 6 6	S11 (18)	55.0-56.5		Stiff gray silty CLAY with frequent fine sand partings (CL)
60		3 4 5	S12 (18)	60.0-61.5		Stiff gray silty CLAY with occasional fine sand partings (CL)
65		WOR/18"	S13 (18)	65.0-66.5		Very soft gray silty CLAY (disturbed by drilling operations) (CL)
70						

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B129
FILE NO. 5556
SHEET NO. 3 OF 4

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		3 3 3	S14 (18)	70.0- 71.5		Medium stiff gray silty CLAY with occasional pockets of blue silty CLAY (CL)
75		3 4 3	S15 (18)	75.0- 76.5		Medium stiff gray silty CLAY (CL)
80		WOR/ 18"	S16 (18)	80.0- 81.5		Very soft gray silty CLAY (CL)
85		WOR/ 12" 3	S17 (18)	85.0- 86.5		Soft gray silty CLAY (CL)
90		WOR/ 12" 3	S18 (18)	90.0- 91.5		Soft gray silty CLAY (CL)
					94.0	
95		39 17 12	S19 (2)	95.0- 96.5		Medium dense gray clayey GRAVEL, little silt (GC)
					98.0±	NOTE: Sand and gravel blew up into casing to 98.0 ft. Washed back down to 100.0 ft; Kept positive head of water in casing, sand and gravel still blowing up inside casing, skipped sample interval and went to 105.0 ft.
100						- GLACIAL OUTWASH -
105		35 29 31 33	NR	105.0- 107.0		No Recovery NOTE: Attempted second split spoon sample, but sand and gravel ran up in casing to approximately 103.5 ft
					108.0±	
110		30 19	S20 (8)	109.5 - 111.5		Dense gray coarse to fine sandy GRAVEL, little silt (bonded in-situ)(GM-SM) GLACIAL TILL -

BORING NO. B129

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B129
FILE NO. 5556
SHEET NO. 4 OF 4

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		22 21	S20 (8)	109.5- 111.5		Dense gray coarse to fine sandy GRAVEL, little silt (bonded in-situ). (GM-SM)
						- GLACIAL TILL -
115		67 48 41 30	S21 (6)	114.5- 116.5		Very dense gray coarse to fine sandy GRAVEL, little silt (bonded in-situ) (GM-SM) - GLACIAL TILL -
						Bottom of Exploration at 116.5 ft.
120						

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	TEST BORING REPORT	BORING NO. B312

PROJECT	Pier 4 Development, Boston, Massachusetts	FILE NO. 5662
CLIENT	The Boston Mariner Co., Inc., Boston, Massachusetts	SHEET NO. 1 OF 5
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island	LOCATION See Plan

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NV I1
INSIDE DIAMETER (IN)	4/3	1-3/8	2
HAMMER WEIGHT (LB)		140	-
HAMMER FALL (IN)		30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE Truck Mounted Mobile B-60
BIT TYPE Roller Bit
DRILL MUD --
OTHER Advanced HW casing to 30.0ft
Telescoped NW casing to 150.0ft
Cored 150.0 to 168.5 ft. BOE

ELEVATION 17.2
DATUM Boston City Base
START 6 Nov 1985
FINISH 12 Nov 1985
DRILLER J. Texeira
H&A REP T.M. Cormican

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	50				0.5	ASPHALT
	66	36 36 76 52	S1 (16)	0.5- 2.5	2.5	Very dense mixed black-brown gravelly coarse to fine SAND, some ash/cinders, trace red brick - FILL -
	72 49					NOTE: Water encountered at 4.0 ft
5		13 23 20 27	S2 (8)	4.0- 6.0		Dense gray silty coarse to fine SAND, some red brick little gravel - FILL -
						NOTE: (Driller washed ahead 5 ft each time with roller bit before drilling in casing at 14.0 ft, switched over from drilling casing in to driving casing)
						NOTE: (Roller bit "granite" block 10.0 - 12.0 ft)
10		32 14 7 12	S3 (9)	10.0- 12.0		Very stiff black fine sandy ORGANIC SILT with 3-inch layer of brown medium to fine sand, little coarse sand, gravel - FILL -
15		17 11 9 8	NR	14.0- 16.0		No Recovery
		5 8 14 5	NR	16.0- 18.0		No Recovery
		50/3" 50/0"	S4 (3)	19.0- 19.3		Very dense black coarse to fine SAND, little gravel, silt - FILL -
20						NOTE: Roller bit "granite" block 19.3 to 20.0 ft
					24.0	
25		7 17 16 23	S5 (18)	24.0- 26.0		Dense gray-brown medium to fine SAND, with frequent partings of silt (SM)
30		12 22	S6 (18)	29.0- 31.0		Dense stratified yellow-gray silty fine SAND and fine sandy silt

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
8 Nov 1985	7:00	---	30.0	94.0	11.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
C	Core Run
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	150.0 ft
ROCK CORED (LIN FT)	18.5 ft
SAMPLES	30S, 4T, 4C

BORING NO. B312

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B312
FILE NO. 5662
SHEET NO. 2 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30	24	24 32	S6 (18)	29.0- 31.0		Dense stratified yellow-gray silty fine SAND and fine sandy silt (SM)
					33.8	
35		3 2 4	S7 (12)	34.0- 35.5	35.5	Medium stiff stratified gray silty CLAY, silt and fine sand (CL)
		9	S7A (6)	35.5- 36.0		Stiff gray silty CLAY (CL)
40		3 3 3 4	S8 (24)	39.0- 41.0		Medium stiff gray silty CLAY (CL)
45		2 3 4 8	S9 (24)	44.0- 46.0		Medium stiff, stratified gray silty CLAY, little fine sand (CL)
50		P U S H	T1 (24)	49.0- 51.0		
		WOR 9 9 10	S10 (18)	51.0- 53.0		Very stiff gray silty CLAY (CL)
55		3 4 6 7	S11 (18)	54.0- 56.0		Stiff gray silty CLAY (CL)
60		3 4 9 11	S12 (24)	59.0- 61.0		Stiff gray silty CLAY (CL)
65		4 5 9 9	S13 (24)	64.0- 66.0		Stiff gray silty CLAY (CL)
70		P U S H	T2 (24)	69.0- 71.0		

BORING NO. B312

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B312
FILE NO. 5662
SHEET NO. 3 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		P U S H	T2 (24)	69.0- 71.0		
		WOR/ 12" 6 7	S14 (18)	71.0- 73.0		Medium stiff gray silty CLAY (CL)
75		WOR 5 6 12	S15 (24)	74.0- 76.0		Stiff gray silty CLAY with occasional silt partings (CL)
80		WOR 5 5 9	S16 (24)	79.0- 81.0		Stiff gray silty CLAY (CL)
85		WOR/ 18" 7	S17 (24)	84.0- 86.0		Very soft gray silty CLAY (CL)
90		WOR/ 24"	S18 (24)	89.0- 91.0		Very soft gray silty CLAY (CL)
95		P U S H	T3 (24)	94.0- 96.0		
		WOR/ 24"	S19 (12)	96.0- 98.0		Very soft gray silty CLAY (CL)
					98.0 99.0	Medium to fine SAND layer (NOTE: Also lost drilling (water)
100		WOR/ 24"	S20 (24)	99.0- 101.0		Very soft gray silty CLAY (CL)
105		WOR/ 24"	S21 (24)	105.0- 107.0		Very soft gray silty CLAY (CL)
110		WOR WOR	S22 (24)	109.0- 111.0		Very soft gray silty CLAY (CL)

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B312
FILE NO. 5662
SHEET NO. 4 OF 5

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		WOR WOR	S22 (24)	109.0- 111.0		Very soft gray silty CLAY (CL)
115		WOR/ 24"	S23 (24)	114.0- 116.0		Very soft gray silty CLAY (CL)
120		WOR/ 24"	S24 (24)	119.0- 121.0		Very soft gray silty CLAY (CL)
125		WOR/ 24"	S25 (24)	124.0- 126.0		Very soft gray silty CLAY (CL)
130		WOR/ 18" 7	S26 (24)	129.0- 131.0		Very soft gray silty CLAY with frequent fine sand partings last 6 inches (CL)
					133.4	
135		15 17 23 37	S27 (15)	134.0- 136.0		Dense light gray fine sandy SILT, little medium sand, clay, trace coarse sand, gravel (well bonded in-situ) (SM) - GLACIAL TILL -
140		17 16 23 29	S28 (7)	139.0- 141.0		Dense light gray silty medium to fine SAND, little coarse sand, clay, trace gravel (well bonded in-situ) (SM) - GLACIAL TILL -
					144.0	
145		50 60 75 *150	S29 (8)	144.0- 146.0		Gray, very severely weathered ARGILLITE * (Indicates that the split spoon was driven with a 300-lb hammer)
					149.0	
150						NOTE: (See Core Boring Report, Page 5)

BORING NO. B312

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B312
FILE NO. 5662
SHEET NO. 5 OF 5

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY RQD IN.	%	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						149.0	------------------------------
150	4 6 10 10	150.0 C 1 154.0	36 5	75 14	SLIGHTLY		Medium to soft, slightly weathered, extremely to moderately fractured, gray, aphanitic ARGILLITE; very close to close, tight to open, steeply dipping (55°- 85°) to vertical (85°- 90°), smooth to rough joints (presence of previously "healed" joint); minor shear displacements; very thin, high angle (55°- 85°) bedding.
155	5 6 6 7 7	154.0 C 2 159.0	44 10	73 23	SLIGHTLY		Soft, slightly weathered, (NOTE: from 158.7 ft to 159.0 ft completely weathered), extremely to moderately fractured, gray, aphanitic, ARGILLITE; very close to close, tight to open, steeply dipping (55°- 85°), smooth to rough joints; very thin, high angle (55°- 85°) to vertical (85°- 90°) bedding.
160	6 6 6 7 7/6"	159.0 C 3 163.5	45 0	83 0	SLIGHTLY		Soft, slightly weathered, extremely to moderately fractured, gray, aphanitic, ARGILLITE; very close to close, open to tight, steeply dipping (55°- 85°) to vertical (85°- 90°), smooth to rough joints (presence of previously "healed" joints); very thin, high angle (55°- 85°) to vertical (85°- 90°) bedding, with occasional clay fillings.
165	7 7 7 7 7	163.5 C 4 168.5	58 37	97 64	SLIGHTLY		Medium to soft, slightly weathered, moderately to slightly fractured, gray, aphanitic, ARGILLITE; close, tight to open, steeply dipping (55°- 85°) to vertical (85°- 90°) smooth to rough joints (presence of previously "healed" joints); minor shear displacement at 164.5 ft; very thin, high angle (55°- 85°) to vertical (85°- 90°) bedding.
170							Bottom of Exploration at 168.5 ft.

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B313

PROJECT	Pier 4 Development, Boston, Massachusetts
CLIENT	The Boston Mariner Co., Inc., Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5662
SHEET NO.	1 OF 6
LOCATION	See Plan
ELEVATION	16.4
DATUM	Boston City Base
START	7 Nov 1985
FINISH	13 Nov 1985
DRILLER	G. Brouillette
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HW/NW	S	NWD3
INSIDE DIAMETER (IN)	4/3	1-3/8	2
HAMMER WEIGHT (LB)	Drilled	140	-
HAMMER FALL (IN)	in	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck Mounted CME-75
BIT TYPE	Roller Bit
DRILL MUD	--
OTHER	Advanced HW casing to 34 ft Went open hole to 144.0ft;Telescoped NW casing to 149.0 ft.

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	ASPHALT
		10 10 15 15	S1 (18)	0.5- 2.5		Medium dense black silty medium to fine SAND, little coarse sand, trace red brick, with 3-inch layer of yellow-brown medium to fine sand at top of sample - FILL -
	D					
	R					
	I					
	L	3 1 1 1	S2 (3)	4.0- 6.0		Loose, gray-black silty medium to fine SAND
5	L					NOTE: Water at 4.5 ft - FILL -
	E					
	D					
	H	1 1 1 1	S3 (3)	9.0- 11.0		Very soft to soft yellow-gray silty CLAY, little fine sand - FILL -
10	W					
	C					
	A					
	S	5 6 2 3	S4 (9)	14.0- 16.0		Loose intermixed black-gray silty coarse to fine SAND and silty clay
15	I					
	N					- FILL -
	G					
					19.0	
	T	2 3 4 5	S5 (6)	19.0- 21.0		Medium stiff gray ORGANIC SILT, trace fine sand (OL)
20	O					
	24 FT					
					24.0	
	60	11 12 13 28	S6 (18)	24.0- 26.0		Medium dense yellow-gray medium to fine SAND, trace silt with occasional partings of silt (SM)
25	65					
	71					
	93					
	66					
	25	7 8	S7 (12)	29.0- 30.5		Medium dense stratified yellow-gray medium to fine(SM) SAND and silty fine sand
30						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
8 Nov 1985	7:00	--	34.0	63.0	10.0

SAMPLE IDENTIFICATION

O	OPEN END ROD
T	THIN WALL TUBE
U	UNDISTURBED SAMPLE
S	SPLIT SPOON
C	Core Run
WOR	Weight of Rods

SUMMARY

OVERBURDEN (LIN FT)	154.0 ft
ROCK CORED (LIN FT)	10.0 ft
SAMPLES	31S, 8U, 4T, 2C

BORING NO. B313

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B313
FILE NO. 5662
SHEET NO. 2 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		12	S7 (12)	29.0-30.5	30.5	Medium dense stratified yellow-gray medium to fine SAND and silty fine sand
	35	7	S7A (6)	30.5-31.0		Medium stiff gray silty CLAY (CL)
	30					
	29					
	41					
35		2 3 3 4	S8 (24)	34.0-36.0		Medium stiff gray silty CLAY, with occasional fine sand partings (CL)
40		P U S H	U1 (21)	39.0-41.0		
		2 3 4 5	S9 (24)	41.0-43.0		Stiff gray silty CLAY (CL)
45		P U S H	T1 (24)	44.0-46.0		
		5 6 6 5	S10 (24)	46.0-48.0		Stiff gray silty CLAY with occasional fine sand partings (CL)
50		P U S H	U2 (24)	49.0-51.0		
		3 5 7 7	S11 (24)	51.0-53.0		Stiff gray silty CLAY (CL)
55		2 4 6 8	S12 (24)	54.0-56.0		Stiff gray silty CLAY with occasional silt partings (CL)
60		P U S H	U3 (24)	59.0-61.0		
		WOR 2 6 8	S13 (24)	61.0-63.0		Medium stiff to stiff gray silty CLAY, with occasional fine sand partings (CL)
65		P U S H	T2 (24)	64.0-66.0		
		WOR/ 12" 2 2	S14 (24)	66.0-68.0		Very soft to soft gray silty CLAY (CL)
70		P U S H	U4 (24)	69.0-71.0		

BORING NO. B313

TEST BORING REPORT

BORING NO. B313
FILE NO. 5662
SHEET NO. 3 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
70		P U S H	U4 (24)	69.0-71.0		
		WOR/24"	S15 (24)	71.0-73.0		Very soft gray silty CLAY with occasional fine sand partings (CL)
75		WOR/12" 2 3	S16 (24)	74.0-76.0		Very soft to soft gray silty CLAY (CL)
80		P U S H	-	79.0-80.5		NOTE: Tube rejected - 6 inches of recovery
		P U S H	U5 (24)	81.0-83.0		
		WOR/12" 1 4	S17 (24)	83.0-85.0		Very soft to soft gray silty CLAY (CL)
85						
90		P U S H	T3 (24)	89.0-91.0		
		WOR/12" 2 4	S18 (24)	91.0-93.0		Very soft to soft gray silty CLAY (CL)
95		WOR/12" 2 4	S19 (24)	94.0-96.0		Very soft to soft gray silty CLAY (CL)
100		P U S H	U6 (22)	99.0-101.0		
		WOR/18" 4	S20 (24)	101.0-103.0		Very soft gray silty CLAY (CL)
105		WOR/24"	S21 (24)	104.0-106.0		Very soft gray silty CLAY (CL)
110		P U S H	U7 (22)	109.0-111.0		

BORING NO. B313

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B313
FILE NO. 5662
SHEET NO. 4 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
110		P U S H	U7 (22)	109.0- 111.0		
		WOR/ 24"	S22 (24)	111.0- 113.0		Very soft gray silty CLAY (CL)
115		WOR/ 24"	S23 (24)	114.0- 116.0		Very soft gray silty CLAY (CL)
120		P U S H	U8 (21)	119.0- 121.0		Very soft gray silty CLAY (CL)
		WOR/ 24"	S24 (24)	121.0- 123.0		Very soft gray silty CLAY (CL)
125		WOR/ 24"	S25 (24)	124.0- 126.0		Very soft gray silty CLAY (CL)
130		P U S H	-	129.0- 131.0		NOTE: Tube rejected - 9 inches of recovery
		P U S H	T4 (20)	131.0- 133.0		
135		WOR/ 24"	S26 (24)	134.0- 136.0		Very soft gray silty CLAY (CL)
		WOR/ 12"	S27 (12)	139.0- 140.0	140.0	
140		14 36	S27A (8)	140.0- 141.0		Dense to very dense gray silty medium to fine SAND, little coarse sand, trace gravel (bonded in-situ) (SM) - GLACIAL TILL -
145		55 44 42	S28 (7)	144.0- 145.5		Very dense gray silty medium to fine SAND, little coarse sand, little to trace gravel (well bonded in-situ) (SM) - GLACIAL TILL -
					148.5	
		150/6"	S29 (6)	149.0- 149.5		Gray severely weathered fine sandy ARGILLITE
150						

BORING NO. B313

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B313
FILE NO. 5662
SHEET NO. 5 OF 6

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
150						
					153.0	
		120/2"	NR	154.2		No Recovery (NOTE: See Core Boring Report, page 6)
155						
160						
165						Bottom of Exploration at 164.0 ft

BORING NO. B313

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

CORE BORING REPORT

BORING NO. B313
FILE NO. 5662
SHEET NO. 6 OF 6

DEPTH (FT.)	DRILLING RATE MIN./FT.	CORE NO. / DEPTH (FT.)	RECOVERY RQD IN.	RECOVERY RQD %	WEATHERING	STRATA CHANGE (FT.)	VISUAL CLASSIFICATION AND REMARKS
						153.0	--
	5	154.0	60	100	VERY SLIGHTLY to SLIGHTLY		Medium to soft, very slightly to slightly weathered, slightly fractured to sound (occasionally extremely fractured), gray, fine grained, argillaceous SANDSTONE; very close to moderately close, tight to open, steeply dipping (55 - 85) [ocassionally horizontal], smooth to rough joints (presence of previously "healed" joints).
155	6						
	6	C 1					
	6						
	6	159.0	44	73			
	5	159.0	48	80	VERY SLIGHTLY to SLIGHTLY		Medium to soft, very slightly to slightly weathered, moderately to slightly fractured, (occasionally extremely fractured and sound), gray, fine grained, argillaceous SANDSTONE; very close to close, tight to open, steeply dipping (55 - 85) [occasionally horizontal], smooth to rough joints (presence of previously "healed" joints; minor shear displacement at 164.5 ft; clay filling at 166.1 to 166.2 ft, 166.3 to 166.4 ft and 167.7 to 167.9 ft
160	5						
	5	C 2					
	5						
	5	164.0	20	33			
165							Bottom of Exploration at 164.0 ft
170							

BORING NO. B313

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B314

PROJECT	Pier 4 Development, Boston, Massachusetts
CLIENT	The Boston Mariner Co., Inc., Boston, Massachusetts
CONTRACTOR	Guild Drilling Co., Inc., E. Providence, Rhode Island

FILE NO.	5662
SHEET NO.	1 OF 2
LOCATION	See Plan
ELEVATION	16.6
DATUM	Boston City Base
START	11 Dec 1985
FINISH	12 Dec 1985
DRILLER	G. Brouiliette
H&A REP	T.M. Cormican

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	HSA/HW	S	-
INSIDE DIAMETER (IN)	3-3/4/4	1-3/8	-
HAMMER WEIGHT (LB)	-	140	-
HAMMER FALL (IN)	-	30	-

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE	Truck Mounted CME-75
BIT TYPE	Roller Bit
DRILL MUD	--
OTHER	Advanced Hollow Stem Augers to 29.0 ft. Removed and replaced with HW casing. Went open hole to 61.0 ft

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		*6 *10 *8 *10	E1 (6)	0.0- 2.0	0.2	ASPHALT Medium dense brown medium to fine sandy GRAVEL, little coarse sand, trace silt - FILL - * indicates drove split spoon with a 300-lb hammer
		6 6 6 10	S1 (10)	2.0- 4.0		Stiff mottled gray silty CLAY, little medium to fine sand, trace coarse sand, red brick - FILL -
5		9 18 26 26	E2 (15)	4.0- 6.0		Dense gray silty medium to fine SAND, little clay, little to trace coarse sand, trace gravel, red brick - FILL -
		6 6 5 9	S2 (18)	6.0- 8.0		Medium dense gray silty medium to fine SAND, some clay, trace coarse sand, gravel, red brick - FILL -
10		4 3 3 42	E3 (24)	9.0- 11.0		Medium stiff gray silty CLAY, little medium to fine sand, trace coarse sand, gravel, asphalt - FILL -
		3 1 2 2	S3 (12)	11.0- 13.0		Soft to medium stiff mottled gray-brown silty CLAY, little medium to fine sand, trace corrse sand, asphalt - FILL -
		*120/1"	E4 (1)	14.0- 14.1	15.0	Very dense ASPHALT - FILL - * Indicates drove split spoon with a 300-lb hammer
15		1 2 3 7	E5 (18)	15.0- 17.0	17.0	Medium stiff black ORGANIC SILT, little clay, trace medium to fine sand, peat fiber, wood (OL)
		3 5 8 10	S4 (18)	17.0- 19.0		Medium dense gray medium to fine SAND, little to trace silt, (organic odor), trace shells (SM)
20		7 6 12 25	E6 (24)	19.0- 21.0		Medium dense gray stratified medium to fine SAND and fine sandy silt, trace shells (SM)
		9 15 15 12	S5 (24)	21.0- 23.0	24.0	Medium dense to dense gray stratified medium to fine SAND and silty fine sand (SM)
25		8 30 97	S6 (7)	24.0- 25.5	28.0	Hard yellow-brown Silty CLAY with frequent partings of of fine sandy silt. (CL) NOTE: High blow counts due to split spoon dragging augers down hole as a result of loose sands blowing up inside and becoming wedged around split spoon.
30		5 7	S7 (18)	29.0- 31.0		Very stiff gray silty CLAY, with 7-inch layer of silt (CL)

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
Installed Observation Well					

SAMPLE IDENTIFICATION

O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
S SPLIT SPOON
E 2-inch Environmental Sample

SUMMARY

OVERBURDEN (LIN FT)	61.0 ft
ROCK CORED (LIN FT)	--
SAMPLES	13S, 6E

BORING NO. B314

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

TEST BORING REPORT

BORING NO. B314
FILE NO. 5662
SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY (IN)	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
30		10 15	S7 (18)	29.0- 31.0		Very stiff gray silty CLAY with 7-inch layer of silt (CL)
35		9 11 7 9	S8 (24)	34.0- 36.0		Very stiff gray silty CLAY with 6-inch layer of silty fine sand (CL)
40		2 4 5 8	S9 (24)	39.0- 41.0		Stiff gray silty CLAY with occasional fine sand partings (CL)
45		3 3 3 6	S10 (24)	44.0- 46.0		Medium stiff gray silty CLAY with frequent fine sand partings (CL)
50		2 2 5 6	S11 (24)	49.0- 51.0		Medium stiff gray silty CLAY with occasional fine sand partings and pockets of blue silty clay (CL)
55		1 3 4 6	S12 (24)	54.0- 56.0		Medium stiff gray silty CLAY with occasional pockets of blue silty clay (CL)
60		1 2 3 5	S13 (24)	59.0- 61.0		Medium stiff gray silty CLAY with occasional fine sand partings (CL)

Bottom of Exploration at 61.0 ft.

NOTE: Observation Well installed in completed borehole. Refer to installation report for details

Appendix D

APPENDIX D

Groundwater Observation Well Installation and Monitoring Data

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

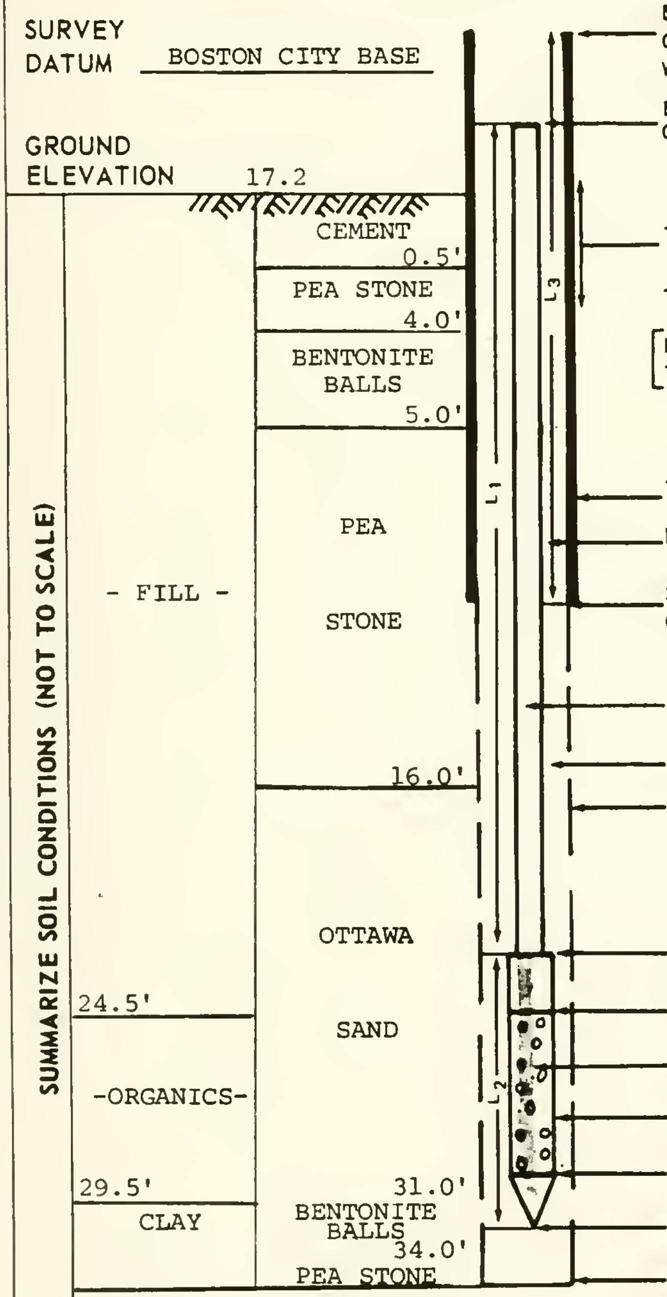
GROUND WATER OBSERVATION WELL REPORT

PROJECT: BOSTON FAN PIERS
LOCATION: BOSTON, MA
CLIENT: HBC ASSOCIATES, BOSTON, MA
CONTRACTOR: GUILD DRILLING CO., INC., E. PROVIDENCE, RI
DRILLER: M. FISHER INSPECTOR: T.M. CORMICAN
INSTALLATION DATE 18 NOVEMBER 1985

FILE NO. 5556
WELL NO. B101-OW
BORING NO. B101
LOCATION SEE PLAN
SHEET 1 OF 1

SURVEY DATUM BOSTON CITY BASE

GROUND ELEVATION 17.2



~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF ~~CASING~~ OR ROADWAY BOX	0.2 ft.
~~ELEVATION OR~~ STICKUP ~~ABOVE~~/BELOW GROUND SURFACE OF RISER PIPE.	0.1 ft.
THICKNESS OF SURFACE SEAL	1.5 ft.
TYPE OF SURFACE SEAL	Cement/Bentonite Balls
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]	
TYPE OF CASING	Roadway Box
INSIDE DIAMETER OF CASING	3-1/4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF CASING	1.8 ft.
INSIDE DIAMETER OF RISER PIPE	2 in.
TYPE OF BACKFILL AROUND RISER	Ottawa Sand/ Pea Stone
DIAMETER OF BOREHOLE	4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF RISER	18.5 ft.
TYPE OF POINT OR MANUFACTURER	Machine Slotted PVC
SCREEN GAUGE OR SIZE OF OPENINGS	0.010 in.
DIAMETER OF WELLPOINT	2 in.
TYPE OF BACKFILL AROUND POINT	Ottawa Sand
~~ELEVATION~~/DEPTH OF BOTTOM OF POINT	30.0 ft.
~~ELEVATION~~/DEPTH OF BOTTOM OF BOREHOLE	146.0 ft.

Bottom of Exploration
at 146.0 ft.

[FIGURES REFER TO: EL. ____ DEPTH X]

2.0 ft.	20.0 ft.	+	10.0 ft.	=	30.0 ft.
LENGTH OF CASING L_3	LENGTH OF RISER PIPE (L_1)		LENGTH OF POINT (L_2)		PAY LENGTH

H & A FORM 59 SEP.72

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

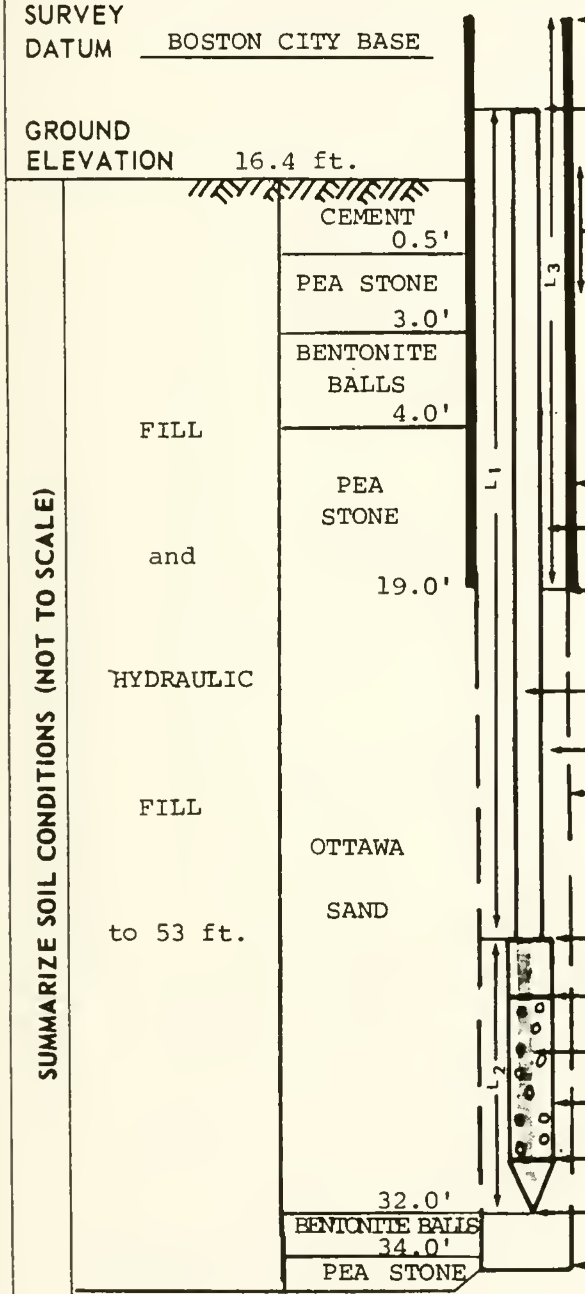
GROUND WATER OBSERVATION WELL REPORT

PROJECT: BOSTON FAN PIERS
LOCATION: BOSTON, MA
CLIENT: HBC ASSOCIATES, BOSTON, MA
CONTRACTOR: GUILD DRILLING CO., INC., E. PROVIDENCE, RI
DRILLER: G. BROUILLETTE INSPECTOR: T.M. CORMICAN
INSTALLATION DATE 25 OCTOBER 1985

FILE NO. 5556
WELL NO. B104-OW
BORING NO. B104
LOCATION SEE PLAN
SHEET 1 OF 1

SURVEY DATUM BOSTON CITY BASE

GROUND ELEVATION 16.4 ft.



~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF ~~CASING OR~~ ROAD-WAY BOX	0.1 ft.
~~ELEVATION OR~~ STICKUP ~~ABOVE~~/BELOW GROUND SURFACE OF RISER PIPE.	0.5 ft.
THICKNESS OF SURFACE SEAL	1.5 ft.
TYPE OF SURFACE SEAL	Cement/Bentonite Balls
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]	
TYPE OF CASING	Roadway Box
INSIDE DIAMETER OF CASING	3-1/4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF CASING	1.9 ft.
INSIDE DIAMETER OF RISER PIPE	2 in.
TYPE OF BACKFILL AROUND RISER	Ottawa Sand/ Pea Stone
DIAMETER OF BOREHOLE	4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF RISER	20.5 ft.
TYPE OF POINT OR MANUFACTURER	Machine Slotted PVC
SCREEN GAUGE OR SIZE OF OPENINGS	0.010 in.
DIAMETER OF WELLPOINT	2 in.
TYPE OF BACKFILL AROUND POINT	Ottawa Sand
~~ELEVATION~~/DEPTH OF BOTTOM OF POINT	30.0 ft.
~~ELEVATION~~/DEPTH OF BOTTOM OF BOREHOLE	179.1 ft.

Bottom of Exploration at 179.1 ft.

[FIGURES REFER TO: EL. ____ DEPTH X]

[2.0 ft. LENGTH OF CASING L_3]	[20.0 ft. LENGTH OF RISER PIPE (L_1)	+	10.0 ft. LENGTH OF POINT (L_2)	=	30.0 ft. PAY LENGTH]		

H&A FORM 59 SEP.72

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

GROUND WATER OBSERVATION WELL REPORT

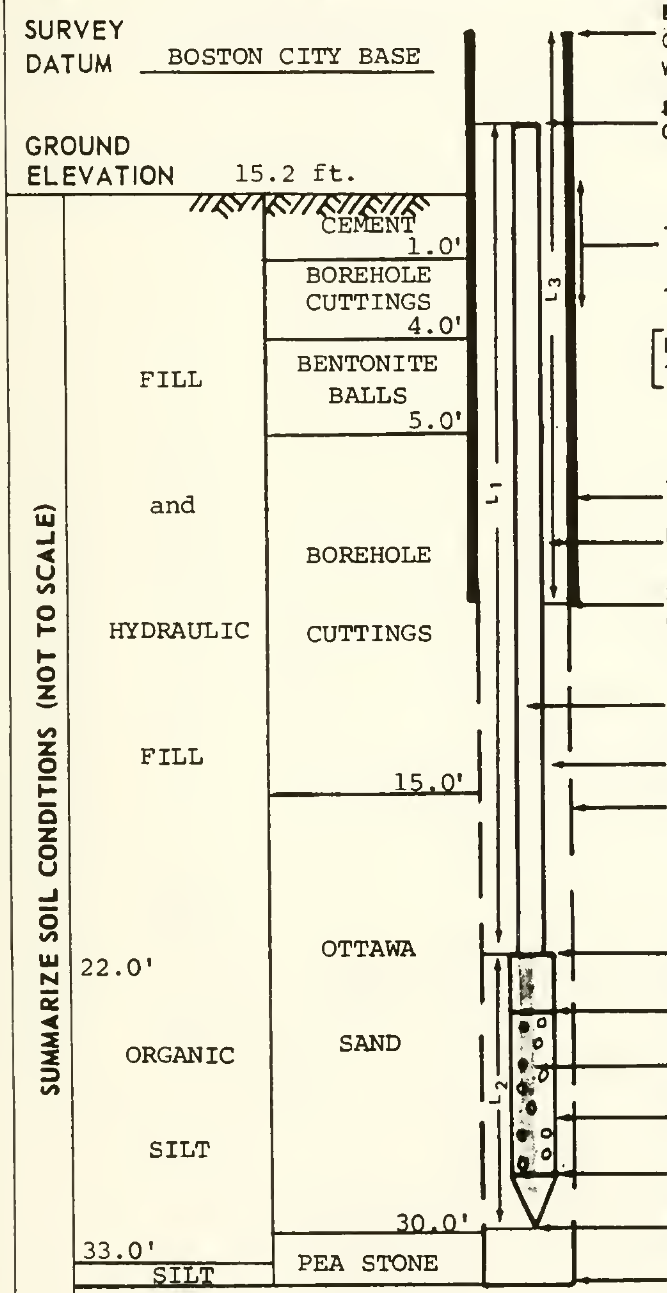
PROJECT: BOSTON FAN PIERS
LOCATION: BOSTON, MA
CLIENT: HBC ASSOCIATES, BOSTON, MA
CONTRACTOR: GUILD DRILLING CO., INC., E. PROVIDENCE, RI
DRILLER: G.BROUILLETTE INSPECTOR: R. HEATH
INSTALLATION DATE 4 OCTOBER 1985

FILE NO. 5556
WELL NO. B112-OW
BORING NO. B112
LOCATION SEE PLAN

SHEET 1 OF 1

SURVEY DATUM BOSTON CITY BASE

GROUND ELEVATION 15.2 ft.



~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF ~~CASING OR~~ ROADWAY BOX	0.0 ft.
~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF RISER PIPE.	0.0 ft.
THICKNESS OF SURFACE SEAL	2.0 ft.
TYPE OF SURFACE SEAL	Cement/Bentonite Balls
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]	
TYPE OF CASING	Roadway Box
INSIDE DIAMETER OF CASING	3-1/4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF CASING	2.0 ft.
INSIDE DIAMETER OF RISER PIPE	2 in.
TYPE OF BACKFILL AROUND RISER	Ottawa Sand/ Borehole Cuttings
DIAMETER OF BOREHOLE	3 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF RISER	20.0 ft.
TYPE OF POINT OR MANUFACTURER	Machine Slotted PVC
SCREEN GAUGE OR SIZE OF OPENINGS	0.010 in.
DIAMETER OF WELLPOINT	2 in.
TYPE OF BACKFILL AROUND POINT	Ottawa Sand
~~ELEVATION~~/DEPTH OF BOTTOM OF POINT	30.0 ft.
~~ELEVATION~~/DEPTH OF BOTTOM OF BOREHOLE	157.0 ft.

Bottom of Exploration at 157.0 ft.

[FIGURES REFER TO: EL. ____ DEPTH X]

LENGTH OF CASING L_3	LENGTH OF RISER PIPE (L_1)	+	LENGTH OF POINT (L_2)	=	PAY LENGTH
2.0 ft.	20.0 ft.	+	10.0 ft.	=	30.0 ft.

H & A FORM 59 SEP.72

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

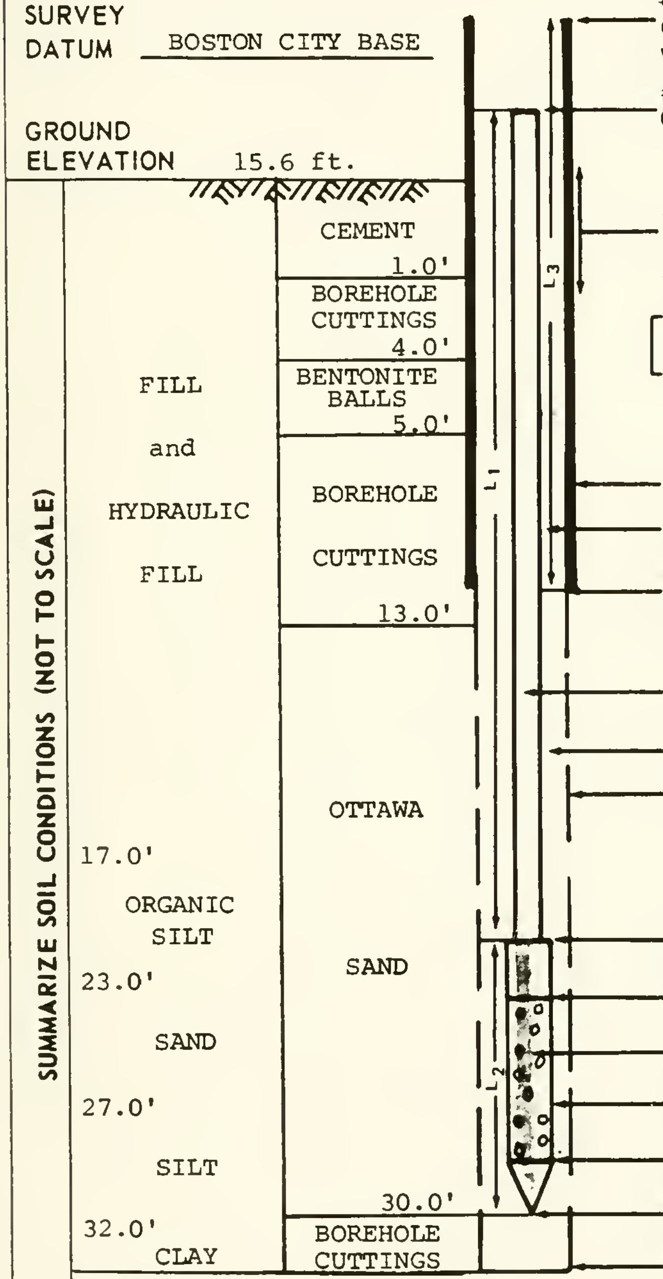
GROUND WATER OBSERVATION WELL REPORT

PROJECT: BOSTON FAN PIERS
LOCATION: BOSTON, MA
CLIENT: HBC ASSOCIATES, BOSTON, MA
CONTRACTOR: GUILD DRILLING CO., INC., E. PROVIDENCE, RI
DRILLER: G. BROUILLETTE INSPECTOR: T.M. CORMICAN
INSTALLATION DATE 9 OCTOBER 1985

FILE NO. 5556
WELL NO. B116-OW
BORING NO. B116
LOCATION SEE PLAN
SHEET 1 OF 1

SURVEY DATUM BOSTON CITY BASE

GROUND ELEVATION 15.6 ft.



Bottom of Exploration at 154.0 ft.

~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF ~~CASING OR~~ ROADWAY BOX: 0.0 ft.
~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF RISER PIPE: 0.0 ft.
THICKNESS OF SURFACE SEAL: 2.0 ft.
TYPE OF SURFACE SEAL: Cement/Bentonite Balls
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]
TYPE OF CASING: Roadway Box
INSIDE DIAMETER OF CASING: 3-1/4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF CASING: 2.0 ft.
INSIDE DIAMETER OF RISER PIPE: 2 in.
TYPE OF BACKFILL AROUND RISER: Ottawa Sand/Borehole Cuttings
DIAMETER OF BOREHOLE: 4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF RISER: 18.0 ft.
TYPE OF POINT OR MANUFACTURER: Machine Slotted PVC
SCREEN GAUGE OR SIZE OF OPENINGS: 0.010 in.
DIAMETER OF WELLPOINT: 2 in.
TYPE OF BACKFILL AROUND POINT: Ottawa Sand
~~ELEVATION~~/DEPTH OF BOTTOM OF POINT: 28.0 ft.
~~ELEVATION~~/DEPTH OF BOTTOM OF BOREHOLE: 154.0 ft.

[FIGURES REFER TO: EL. ____ DEPTH X]

2.0 ft.	18.0 ft.	+	10.0 ft.	=	30.0 ft.
LENGTH OF CASING L_3	LENGTH OF RISER PIPE (L_1)		LENGTH OF POINT (L_2)		PAY LENGTH

H & A FORM 59 SEP. 72

HALEY & ALDRICH, INC.
CONSULTING SOIL ENGINEERS

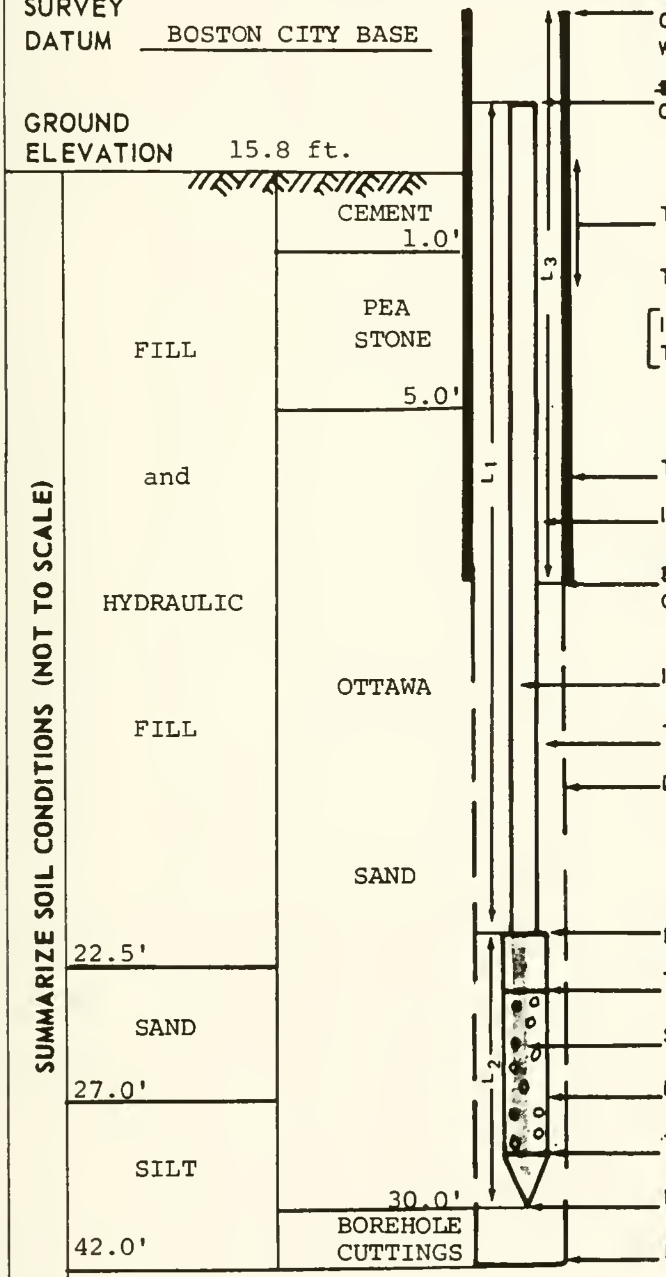
GROUND WATER OBSERVATION WELL REPORT

PROJECT: BOSTON FAN PIERS
LOCATION: BOSTON, MA
CLIENT: HBC ASSOCIATES, BOSTON, MA
CONTRACTOR: GUILD DRILLING CO., INC., E. PROVIDENCE, RI
DRILLER: M. FISHER INSPECTOR: R. HEATH
INSTALLATION DATE 8 OCTOBER 1985

FILE NO. 5556
WELL NO. B118-OW
BORING NO. B118
LOCATION SEE PLAN
SHEET 1 OF 1

SURVEY DATUM BOSTON CITY BASE

GROUND ELEVATION 15.8 ft.



~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE ~~OF~~ ~~CASING OR~~ ROAD-WAY BOX	0.0 ft.
~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF RISER PIPE.	0.0 ft.
THICKNESS OF SURFACE SEAL	1.0 ft.
TYPE OF SURFACE SEAL	Cement
[INDICATE ALL SEALS SHOWING DEPTH, THICKNESS AND TYPE]	
TYPE OF CASING	Roadway Box
INSIDE DIAMETER OF CASING	3-1/4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF CASING	2.0 ft.
INSIDE DIAMETER OF RISER PIPE	2 in.
TYPE OF BACKFILL AROUND RISER	Ottawa Sand/ Pea Stone
DIAMETER OF BOREHOLE	4 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF RISER	20.0 ft.
TYPE OF POINT OR MANUFACTURER	Machine Slotted PVC
SCREEN GAUGE OR SIZE OF OPENINGS	0.010 in.
DIAMETER OF WELLPOINT	2 in.
TYPE OF BACKFILL AROUND POINT	Ottawa Sand
~~ELEVATION~~/DEPTH OF BOTTOM OF POINT	30.0 ft.
~~ELEVATION~~/DEPTH OF BOTTOM OF BOREHOLE	134.0 ft.

Bottom of Exploration
at 134.0 ft.

[FIGURES REFER TO: EL. ____ DEPTH X]

[2.0 ft. LENGTH OF CASING L_3] [20.0 ft. LENGTH OF RISER PIPE (L_1) + 10.0 ft. LENGTH OF POINT (L_2) = 30.0 ft. PAY LENGTH]

H&A FORM 59 SEP.72

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

GROUND WATER MONITORING REPORT

OW/PZ NUMBER: OW-101

ELEVATION SUBTRAHEND 17.2

FILE NO. 5556

PAGE NO.

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM Ground Surface (FT)	ELEVATION OF WATER (FT)	REMARKS	READ BY
9 Dec. 85	1115		4.1	13.1	Tide El. 7.1	RB
	1225		4.1	13.1	Tide El. 3.9	RB
	1505		4.1	13.1	Tide El. 0.4	JL
	1545		4.1	13.1	Tide El. 0.9	JL
12 Mar 86	1500		5.6	11.6	Tide El. 4.4	DWG
14 Apr 86	1030		5.1	12.1	Tide El. 4.4	TC
25 Apr 86	1030		4.9	12.3	Tide El. 12.4	BPH

H&A FORM JAN. 79 59A

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS	**GROUND WATER MONITORING REPORT**

OW/PZ NUMBER: OW-104

ELEVATION SUBTRAHEND 16.4

FILE NO. 5556

PAGE NO.

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM Ground Surface (FT)	ELEVATION OF WATER (FT)	REMARKS	READ BY
28 Oct. 85	0635	3 days	8.3	8.1	Tide El. 3.5	TC
	0725		8.3	8.1	Tide El. 5.1	TC
	0830		8.3	8.1	Tide El. 7.4	TC
	0925		7.2	9.2	Tide El. 9.5 Flushed @ 0900	TC
	1030		7.8	8.6	Tide El. 10.5 Flushed @ 1110	TC
30 Oct. 85	0630		8.3	8.1	Tide El. 3.3	TC
	0725		8.3	8.1	Tide El. 4.3	TC
	0830		8.3	8.1	Tide El. 6.0	TC
	0930		8.3	8.1	Tide El. 7.9	TC
	1025		8.3	8.1	Tide El. 9.7	TC
	1130		8.3	8.1	Tide El. 10.8	TC
	1225		8.3	8.1	Tide El. 10.7	TC
	1325		8.3	8.1	Tide El. 9.5	TC
	1430		8.3	8.1	Tide El. 7.4	TC
	1505		8.3	8.1	Tide El. 9.6	TC
9 Dec. 85	1110		8.6	7.8	Tide El. 7.2	RB
	1220		8.7	7.7	Tide El. 4.1	RB
	1510		8.8	7.6	Tide El. 0.4	JL
	1540		8.7	7.7	Tide El. 0.9	JL
18 Feb. 86	1230		8.8	7.6	Tide El. 4.1	BH
12 Mar 86	1455		9.8	6.6	Tide El. 4.4	DWG
14 Apr 86	1000		9.1	7.3	Tide El. 3.6	TC
25 Apr 86	1017		8.9	7.5	Tide El. 12.3	BPH

H & A FORM JAN. 79 59A

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

GROUND WATER MONITORING REPORT

OW/PZ NUMBER: OW-112

ELEVATION SUBTRAHEND 15.2

FILE NO. 5556

PAGE NO.

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM GROUND SURFACE (FT)	ELEVATION OF WATER (FT)	REMARKS	READ BY
4 Oct. 85	1138	1 hr.	14.0	1.2	Initial reading	RH
8 Oct. 85	1415		11.0	4.2		RH
9 Oct. 85	0717		7.5	7.7		RH
10 Oct. 85	0728		7.7	7.5		RH
11 Oct. 85	1100		6.7	8.5		RH
28 Oct. 85	0635		12.3	2.9	Tide El. 3.5	TC
	0725		10.6	4.6	Tide El. 5.1	TC
	0830		8.6	6.6	Tide El. 7.4	TC
	0925		6.6	8.6	Tide El. 9.5	TC
	1030		5.5	9.7	Tide El. 10.5	TC
30 Oct. 85	0630		12.3	2.9	Tide El. 3.3	TC
	0725		11.3	3.9	Tide El. 4.3	TC
	0830		9.7	5.5	Tide El. 6.0	TC
	0930		8.0	7.2	Tide El. 7.9	TC
	1025		6.3	8.9	Tide El. 9.7	TC
	1130		5.0	10.2	Tide El. 10.8	TC
	1225		4.8	10.4	Tide El. 10.7	TC
	1325		5.7	9.5	Tide El. 9.5	TC
	1430		7.5	7.7	Tide El. 7.4	TC
	1505		9.2	6.0	Tide El. 5.4	TC
9 Dec. 85	1100		7.4	7.8	Tide El. 7.9	RB
	1205		9.8	5.4	Tide El. 5.1	RB
	1500		14.5	0.7	Tide El. 0.4	JL
	1535		14.4	0.8	Tide El. 0.9	JL
18 Feb. 86	1230		11.7	3.5	Tide El. 4.4	BH
12 Mar. 86			OBSTR	--	Tide El. 4.4	DWG
14 Apr. 86	1020		12.3	2.9	Tide El. 4.2	TC
25 Apr. 86	1005		5.9	9.3	Tide El. 12.0	BPH

H & A FORM 59A JAN. 79

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

GROUND WATER MONITORING REPORT

OW/PZ NUMBER: OW-116

ELEVATION SUBTRAHEND 15.6

FILE NO. 5556

PAGE NO.

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM GROUND SURFACE (FT)	ELEVATION OF WATER (FT)	REMARKS	READ BY
9 Oct. 85	1120	3 hrs.	9.3	6.3	Initial reading; well flushed	RH
10 Oct. 85	0715		9.5	6.1		RH
11 Oct. 85	1110		8.3	7.3		RH
28 Oct. 85	0635		10.8	4.8	Tide El. 3.5	TC
	0725		10.6	5.0	Tide El. 5.1	TC
	0830		10.0	5.6	Tide El. 7.4	TC
	0925		9.3	6.3	Tide El. 9.5	TC
	1030		8.8	6.8	Tide El. 10.5	TC
30 Oct. 85	0630		10.4	5.2	Tide El. 3.3	TC
	0725		10.3	5.3	Tide El. 4.3	TC
	0830		10.0	5.6	Tide El. 6.0	TC
	0930		9.5	6.1	Tide El. 7.9	TC
	1025		9.0	6.6	Tide El. 9.7	TC
	1130		8.4	7.2	Tide El. 10.8	TC
	1225		8.0	7.6	Tide El. 10.7	TC
	1325		7.9	7.7	Tide El. 9.5	TC
	1430		8.2	7.4	Tide El. 7.4	TC
	1525		8.6	7.0	Tide El. 5.4	TC
9 Dec. 85	1110		8.2	7.4	Tide El. 7.3	RB
	1215		8.9	6.7	Tide El. 4.4	RB
	1450		10.6	5.0	Tide El. 0.4	JL
	1540		11.8	3.8	Tide El. 0.9	JL
18 Feb. 86	1230		10.1	5.5	Tide El. 4.4	BH
12 Mar. 86	1450		9.3	6.3	Tide El. 4.4	DWG
14 Apr. 86	1050		10.4	5.2	Tide El. 4.8	TC
25 Apr. 86	1011		8.9	6.7	Tide El. 12.2	TC

H & A FORM 59A JAN. 79

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS

GROUND WATER MONITORING REPORT

OW/PZ NUMBER: OW-118

ELEVATION SUBTRAHEND 15.8

FILE NO. 5556
PAGE NO.

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM GROUND SURFACE (FT)	ELEVATION OF WATER (FT)	REMARKS	READ BY
8 Oct. 85	1410	4 hrs.	9.5	6.3	Initial reading	RH
9 Oct. 85	0720		9.3	6.5		RH
10 Oct. 85	0725		9.7	6.1		RH
11 Oct. 85	1104		9.7	6.1		RH
28 Oct. 85	0635		9.5	6.3	Tide El. 3.5	TC
	0725		9.5	6.3	Tide El. 5.1	TC
	0830		9.5	6.3	Tide El. 7.4	TC
	0925		9.5	6.3	Tide El. 9.5	TC
	1030		9.5	6.3	Tide El. 4.5	TC
30 Oct. 85	0630		10.0	5.8	Tide El. 3.3	TC
	0725		10.0	5.8	Tide El. 4.3	TC
	0830		9.8	6.0	Tide El. 6.0	TC
	0930		9.6	6.2	Tide El. 7.9	TC
	1025		9.7	6.1	Tide El. 9.7	TC
	1130		9.1	6.7	Tide El. 10.8	TC
	1225		9.0	6.8	Tide El. 10.7	TC
	1325		9.0	6.8	Tide El. 9.5	TC
	1430		9.2	6.6	Tide El. 7.4	TC
	1505		9.4	6.4	Tide El. 5.4	TC
9 Dec. 85	1105		9.1	6.7	Tide El. 7.4	RB
	1210		9.4	6.4	Tide El. 4.7	RB
	1445		10.1	5.7	Tide El. 0.4	JL
	1540		10.2	5.6	Tide El. 0.9	JL
18 Feb. 86	1230		9.7	6.1	Tide El. 4.4	BH
12 Mar. 86	1443		9.8	6.0	Tide El. 4.4	DWG
14 Apr. 86	1040		9.6	6.2	Tide El. 4.6	TC
25 Apr. 86	1007		9.7	6.1	Tide El. 12.1	TC

Appendix E

APPENDIX E

Laboratory Soil Test Results

H&A FORM 6 – FEB.74

TABLE E-1

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 1 OF 8

ELEVATION: 15.8 DATUM: BCB

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU. FT.	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ. FT.	CR RR	
B118 U1	Stiff, gray silty CLAY, with frequent silty fine sand seams	50.0-52.0										
		50.1		36.5								TV = 0.40 PP = 0.72
		50.2		39.0								TV = 0.54 PP = 0.85
		50.3		39.4								TV = 0.50 PP = 0.77
		50.4		37.3	48.5	22.9						TV = 0.54 PP = 0.95 SV = 0.62 R = 0.10
		50.5		33.3								TV = 0.57 PP = 0.85
		50.6	C-1	36.0			117.6			4.76	0.158 0.014	
		50.7		39.1								TV = 0.62 PP = 1.12
		50.9	UU-1	34.6			121.1	1885	4.2			
		51.2		40.3								TV = 0.81 PP = 1.47

TABLE E-1 (continued)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 2 OF 8

ELEVATION: 15.8 DATUM: BCB

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU.FT.	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ.FT.	CR RR	
B118 T1 (2.0 in. O.D. Shelby Tube)	Medium stiff, gray silty CLAY, trace silty fine sand	55.0-57.0					113.3					
		55.2		37.7								TV = 0.21 PP = 0.20
		55.3		38.0								TV = 0.26 PP = 0.40
		55.4		--								TV = 0.33 PP = 0.33
		55.5		41.3								TV = 0.32 PP = 0.18
		55.6		42.1								TV = 0.24 PP = 0.10
	Medium stiff to stiff, gray silty CLAY	55.7		36.6								TV = 0.56 PP = 0.40
		55.9		32.8								TV = 0.34 PP = 0.45
		56.0		32.3	32.7	19.6						TV = 0.47 PP = 0.72
	Stiff, gray silty CLAY, trace fine sand, occasional silty fine sand seams	56.2		36.2								TV = 0.55 PP = 0.78
		56.4		35.6								TV = 0.55 PP = 0.80
		56.5		37.3								TV = 0.75 PP = 1.08
		56.7										TV = 0.68 PP = 0.90
		56.9		39.5								PP = 1.21

HALEY & ALDRICH, INC.

TABLE E-1 (continued)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 3 OF 8

ELEVATION: 15.8 DATUM: BCB

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU. FT.	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ. FT.	CR RR	
B118 U2	Medium stiff to stiff, gray silty CLAY, with frequent silty fine sand seams	60.0- 62.0										
		60.1		40.9								TV = 0.42 PP = 0.98
		60.2		39.0								TV = 0.59 PP = 1.12
		60.3		33.8	42.3	22.8						TV = 0.59 PP = 0.95 SV = 0.80 R = 0.18
		60.5		37.4								TV = 0.67 PP = 1.18
		60.6		36.8								
		60.7		43.9								TV = 0.54 PP = 1.12
		60.8	C-2	41.9			113.4			4.10	0.195 0.023	
		60.9		37.7								TV = 0.54 PP = 0.92
		61.1	UU-2	40.2			116.4	1334	3.6			
		61.3										TV = 0.61 PP = 1.08

TABLE E-1 (continued)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 4 OF 8

ELEVATION: 15.8 DATUM: BCB

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU.FT.	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ.FT.	CR RR	
B118 U3	Stiff, gray silty CLAY, with trace silty fine sand	70.0-72.0										
		70.2		37.0								TV = 0.67 PP = 1.60
		70.3		43.4								TV = 0.58 PP = 0.87
		70.4		41.4	52.6	26.2						TV = 0.55 PP = 0.93 SV = 0.64 R = 0.14
		70.5		31.3								TV = 0.65 PP = 0.83
		70.6		42.3								TV = 0.54 PP = 0.98
		70.7	C-3	41.1			115.2			4.40	0.244 0.019	
		70.8		41.2								TV = 0.56 PP = 1.0
		71.0	UU-3	40.4			116.5	2128	2.8			
		71.2		35.1								TV = 0.56 PP = 1.1

TABLE E-1 (continued)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 5 OF 8

ELEVATION: 15.8 DATUM: BCB

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU.FT	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ.FT.	CR RR	
B118 T2	Medium stiff, gray silty CLAY, trace fine sand	75.0- 77.0										
		75.1		44.8								TV = 0.27 PP = 0.30
		75.3		46.1								TV = 0.38 PP = 0.40
		75.5		40.7								TV = 0.38 PP = 0.40
		75.7		43.2								TV = 0.41 PP = 0.60
		75.9		43.7	51.8	25.1						TV = 0.40 PP = 0.43
		76.1		43.5								TV = 0.35 PP = 0.40
		76.3		38.5								TV = 0.45 PP = 0.55
		76.5		32.1								TV = 0.38 PP = 0.40
		76.6		34.6								TV = 0.45 PP = 0.55
		76.8		39.7								TV = 0.40 PP = 0.35
		76.9		41.7								PP = 0.57

H&A FORM 6 – FEB.74

TABLE E-1 (continued)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 6 OF 8

ELEVATION: 15.8 DATUM: BCB

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU.FT	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ.FT.	CR RR	
B118 U4	Medium stiff, gray silty CLAY, occasional silty fine sand seams	80.0- 82.0										
		80.0		47.6								TV = 0.41 PP = 0.72
		80.1		40.4								TV = 0.44 PP = 0.67
		80.3		46.1	53.8	24.9						TV = 0.45 PP = 0.68 SV = 0.50 R = 0.10
		80.4		42.6								TV = 0.46 PP = 0.72
		80.5		34.8								TV = 0.45 PP = 0.72
		80.6		47.3								TV = 0.45 PP = 0.77
		80.7	C-4	44.2			113.2			3.28	0.240 0.024	
		80.8		42.1								TV = 0.46 PP = 0.68
		81.0	UU-4	43.0			113.6	1054	2.9			
		81.2										TV = 0.42 PP = 0.73

H&A FORM 6 – FEB.74

TABLE E-1 (continued)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 7 OF 8

ELEVATION: 15.8 DATUM: BCB

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU.FT.	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ.FT.	CR RR	
B118 U5	Medium stiff, gray silty CLAY, with occasional silty fine sand partings	91.5- 93.5					111.5					
		91.5		36.5								TV = 0.39 PP = 0.53
		91.6		36.3								TV = 0.34 PP = 0.45
		91.7		47.0								TV = 0.38 PP = 0.48
		91.8		44.7	50.5	24.8						TV = 0.34 PP = 0.50 SV = 0.30 R = 0.08
		91.9		31.4								TV = 0.33 PP = 0.50
		92.1	C-5	36.1			116.3			2.87	0.203 0.017	
		92.2		44.8								TV = 0.37 PP = 0.52
		92.6		48.8								TV = 0.34 PP = 0.50
		92.7		43.1								TV = 0.30 PP = 0.47
		92.8	UU-5	48.6			105.6	892	3.0			
		93.1		51.1								TV = 0.31 PP = 0.47
		93.4		48.8								TV = 0.30 PP = 0.47

TABLE E-1 (continued)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BOSTON FAN PIERS, BOSTON, MA

FILE NO. 5556
SHEET 8 OF 8

ELEVATION: 15.8 DATUM: BCB

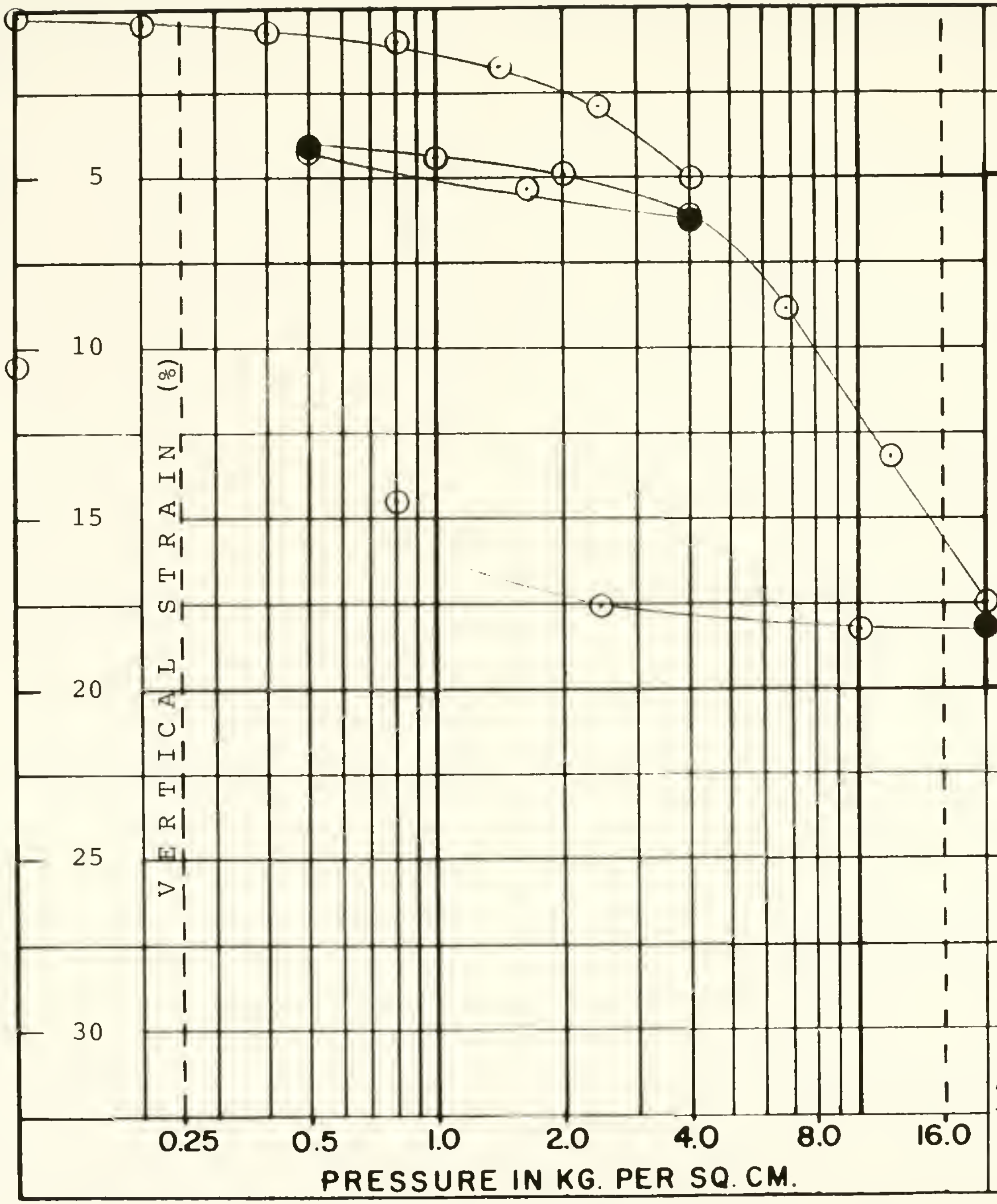
BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS %		UNIT WEIGHT LB/CU.FT.	UU TEST		CONSOLIDATION		OTHER TESTS
					LL	PL		UNDRAINED STRENGTH PSF	STRAIN %	MAX. PAST PRESSURE TON/SQ.FT.	CR RR	
B118 T3	Medium stiff, gray silty CLAY, with frequent silty fine sand partings	95.0-97.0					102.4					
		95.1		41.5								TV = 0.35 PP = 0.45
		95.2		37.0								TV = 0.35 PP = 0.35
		95.3		44.4								TV = 0.34 PP = 0.30
		95.4		47.8								TV = 0.35 PP = 0.35
		95.6		43.7	48.2	22.4						TV = 0.32 PP = 0.40
		95.9		51.0								TV = 0.35 PP = 0.45
		96.0		49.5								TV = 0.34 PP = 0.40
		96.2		45.2								TV = 0.35 PP = 0.50
		96.4		44.3								TV = 0.30 PP = 0.40
		96.5		49.5								TV = 0.32 PP = 0.35
		96.7		41.8								TV = 0.33 PP = 0.30
		96.9		48.4								TV = 0.30 PP = 0.30

NOTES:

TV = Shear strength in TSF as measured by Torvane manufactured by Soiltest.
SV = Shear strength in TSF as measured by Lab Vane manufactured by Geonor.
R = Remolded strength in TSF as measured by Lab Vane manufactured by Geonor.
PP = Compressive strength in TSF as measured by Pocket Penetrometer manufactured by Soiltest.

H&A AUG.'75 50

HALEY & ALDRICH, INC.



SOIL DESCRIPTION Stiff, gray silty CLAY, with frequent silty fine sand seams

BORING B118 SAMPLE U2 DEPTH 60.8 ft.

WATER CONTENT

NATURAL 41.9%

AFTER TEST 38.1%

ATTERBERG LIMITS

LIQUID LIMIT 42.3%

PLASTIC LIMIT 22.8%

NATURAL WATER CONTENT 33.8%

INITIAL VOID RATIO 1.19

NOTE

1 KG. PER SQ CM = 1.024 TONS PER SQ. FT.

BOSTON FAN PIERS
BOSTON, MA

CONSOLIDATION TEST

NO. C-2

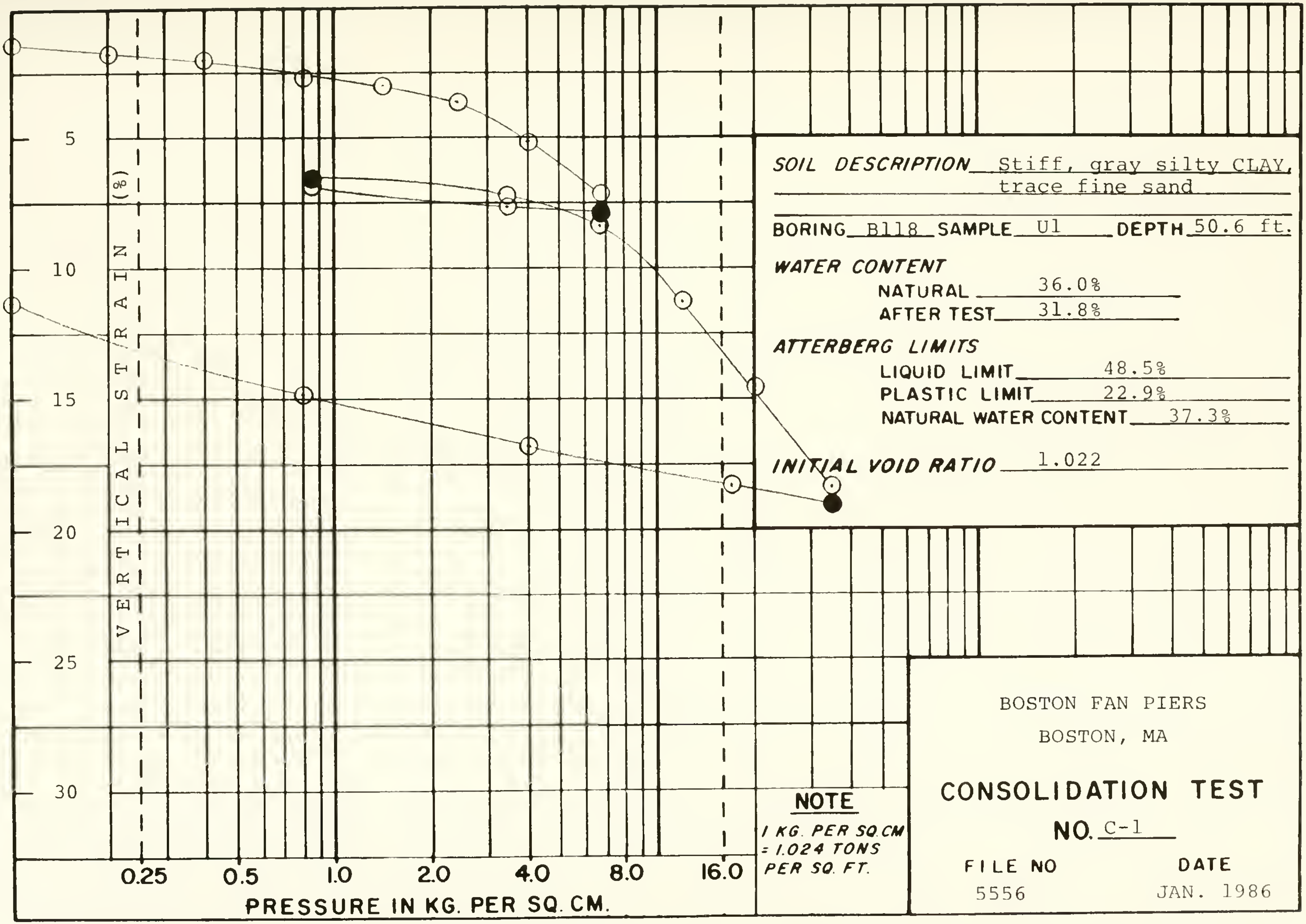
FILE NO 5556

DATE JAN. 1986

FIGURE E-1

H&A 50
AUG.'75

HALEY & ALDRICH, INC.



SOIL DESCRIPTION Stiff, gray silty CLAY, trace fine sand

BORING B118 SAMPLE U1 DEPTH 50.6 ft.

WATER CONTENT
NATURAL 36.0%
AFTER TEST 31.8%

ATTERBERG LIMITS
LIQUID LIMIT 48.5%
PLASTIC LIMIT 22.9%
NATURAL WATER CONTENT 37.3%

INITIAL VOID RATIO 1.022

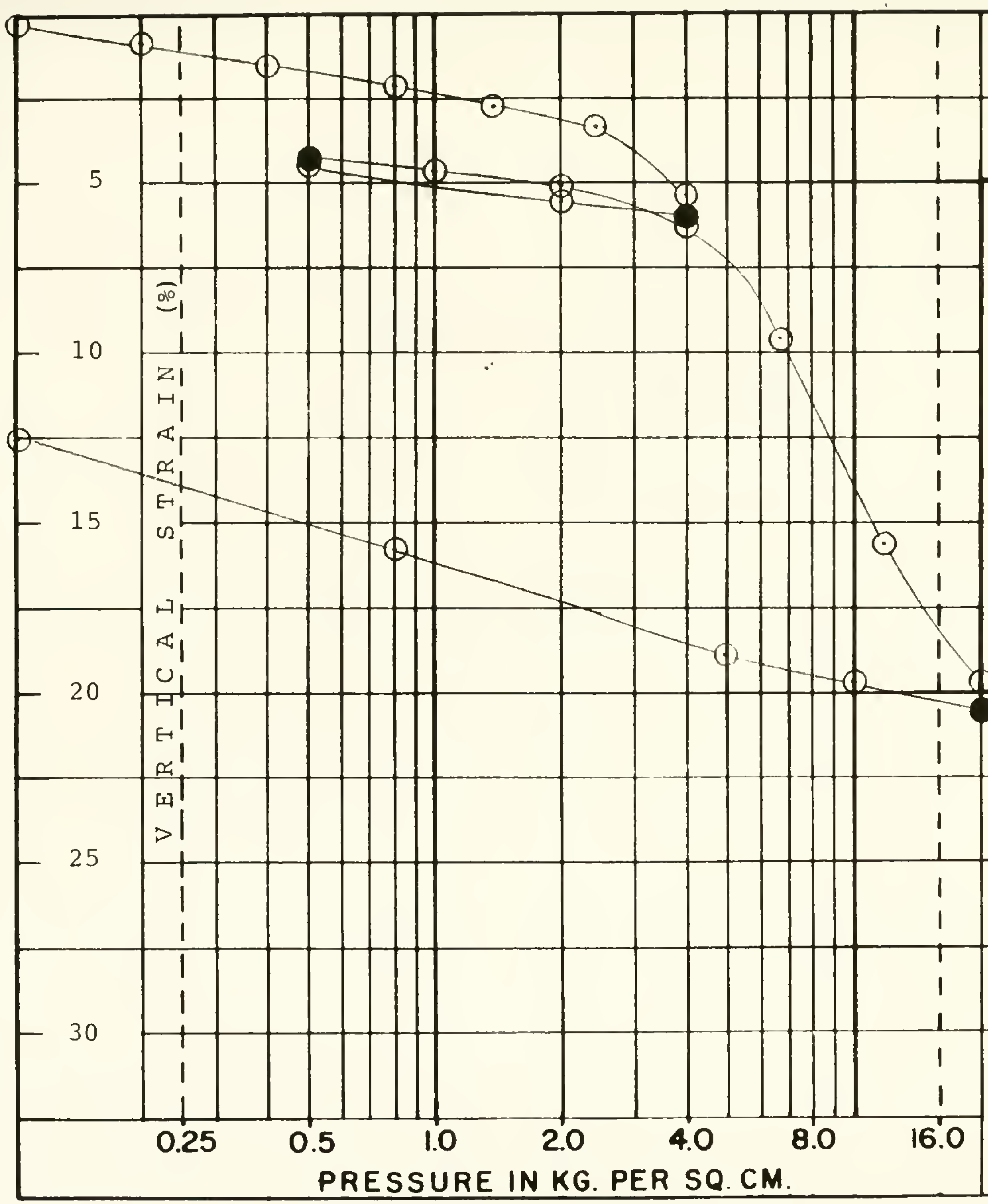
NOTE
1 KG. PER SQ. CM = 1.024 TONS PER SQ. FT.

BOSTON FAN PIERS
BOSTON, MA

CONSOLIDATION TEST
NO. C-1

FILE NO 5556
DATE JAN. 1986

FIGURE E-2



SOIL DESCRIPTION Stiff, gray silty CLAY, trace fine sand

BORING B118 SAMPLE U3 DEPTH 70.7 ft.

WATER CONTENT

NATURAL 41.1%

AFTER TEST 38.2%

ATTERBERG LIMITS

LIQUID LIMIT 52.6%

PLASTIC LIMIT 26.2%

NATURAL WATER CONTENT 41.4%

INITIAL VOID RATIO 1.14

NOTE

1 KG PER SQ CM = 1.024 TONS PER SQ. FT.

BOSTON FAN PIERS
BOSTON, MA

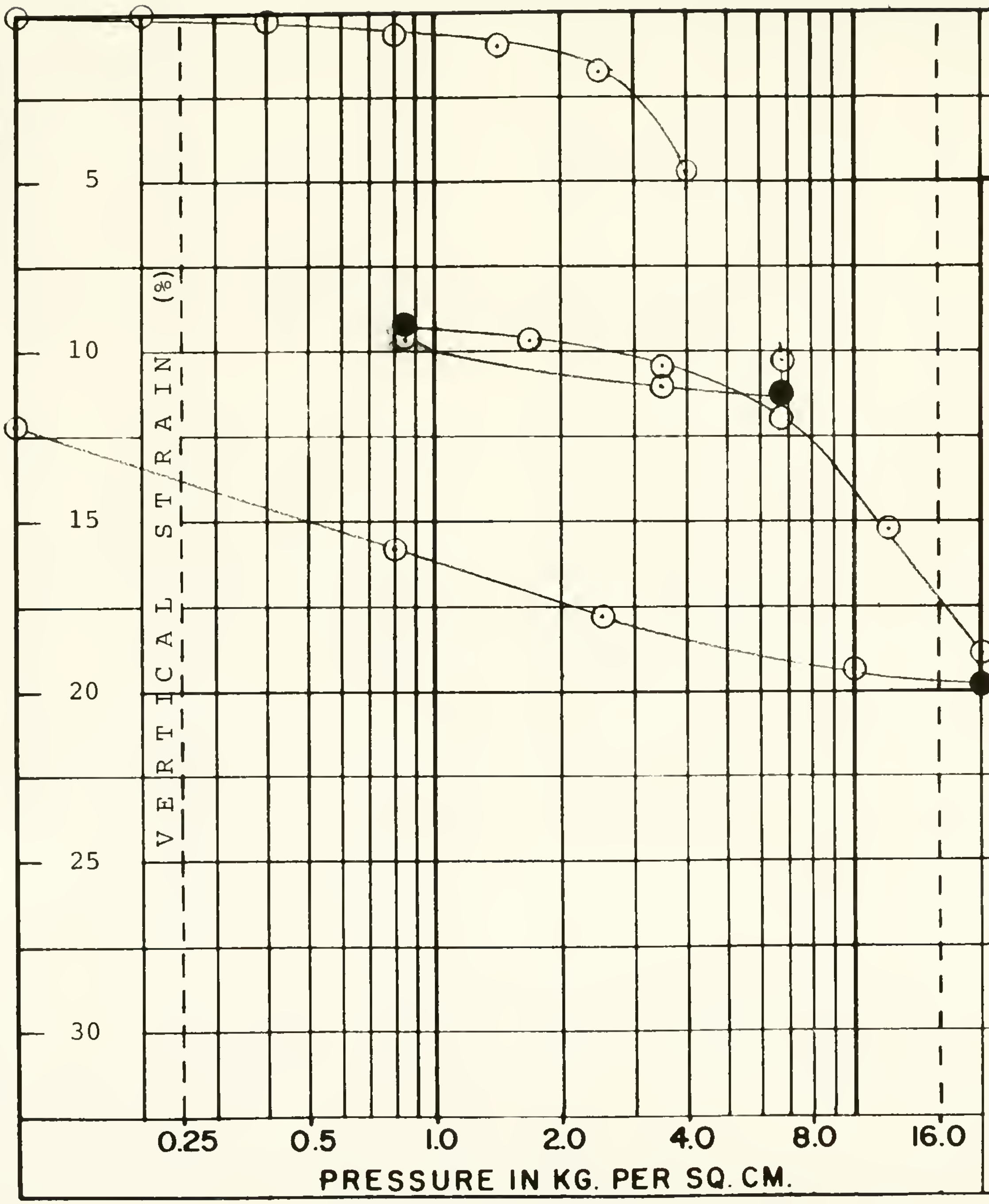
CONSOLIDATION TEST

NO. C-3

FILE NO 5556

DATE JAN. 1986

FIGURE E-3



SOIL DESCRIPTION Medium stiff, gray silty CLAY, with occasional silty fine sand partings

BORING B118 SAMPLE U4 DEPTH 80.7 ft.

WATER CONTENT

NATURAL 44.2%

AFTER TEST 38.1%

ATTERBERG LIMITS

LIQUID LIMIT 53.8%

PLASTIC LIMIT 24.9%

NATURAL WATER CONTENT 46.1%

INITIAL VOID RATIO 1.23

NOTE

1 KG PER SQ CM = 1.024 TONS PER SQ. FT

BOSTON FAN PIERS
BOSTON, MA

CONSOLIDATION TEST

NO. C-4

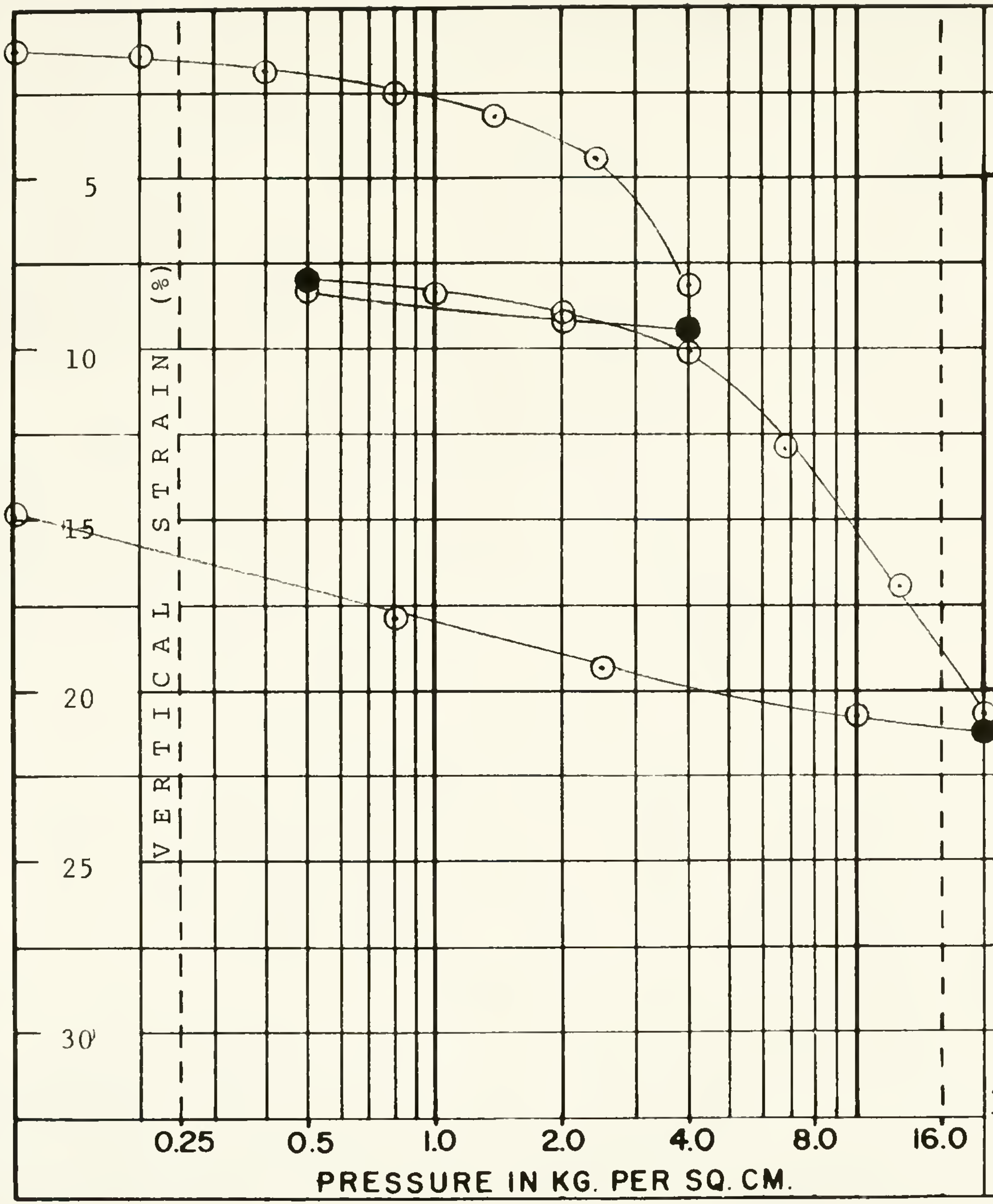
FILE NO 5556

DATE JAN. 1986

HALEY & ALDRICH, INC.

FIGURE E-4

H&A AUG.'75 50



SOIL DESCRIPTION Medium stiff, gray silty CLAY, with occasional fine sand partings

BORING B118 SAMPLE U5 DEPTH 92.1 ft.

WATER CONTENT

NATURAL 36.1%

AFTER TEST 32.1%

ATTERBERG LIMITS

LIQUID LIMIT 50.5%

PLASTIC LIMIT 24.8%

NATURAL WATER CONTENT 44.7%

INITIAL VOID RATIO 1.08

NOTE

1 KG. PER SQ CM = 1.024 TONS PER SQ. FT

BOSTON FAN PIERS
BOSTON, MA

CONSOLIDATION TEST

NO. C-5

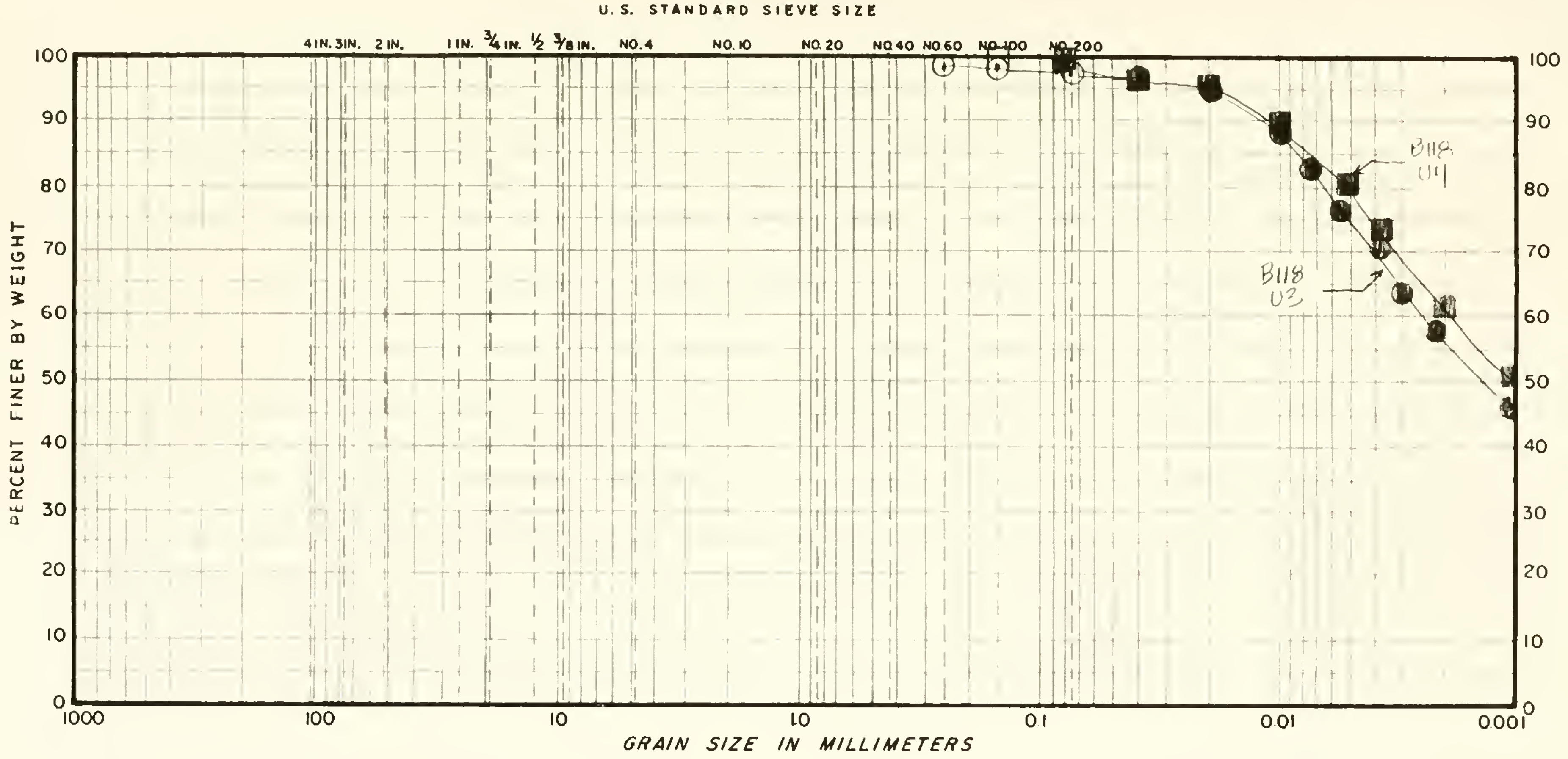
FILE NO 5556

DATE JAN. 1986

HALEY & ALDRICH, INC.

FIGURE E-5

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEERS, U.S ARMY

EXPLORATION NO.	SAMPLE NO.	DEPTH (FT.)	ATTERBERG LIMITS (%)				DESCRIPTION
			w_L	w_P	I_P	w_N	
B118	U3	70.3	52.6	26.2	26.4	41.4	Gray silty CLAY, trace fine sand
B118	U4	80.5	53.8	24.9	28.9	46.1	Gray silty CLAY

PROJECT Boston Fan Pier

Boston, MA

FILE NO 5556 DATE January 1986

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